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FRED'K A. CASTLE, M.D.,

LATE PHYSICIAN TO THE PRESBYTERIAN HOSPITAL AND LECTURER ON PHARMACOLOGY, BELLEVUE HOSPITAL MEDICAL COLLEGE; MEMBER OF THE COMMITTEE OF REVISION AND PUBLICATION OF THE PHARMACOPŒIA OF THE U. S. OF AMERICA.

EDITOR

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CHEMIST OF THE DEPARTMENT OF PUBLIC CHARITIES AND CORRECTION; CHAIRMAN OF THE COMMITTEE OF REVISION AND PUBLICATION OF THE PHARMACOPŒIA OF THE U. S. OF AMERICA.

ASSOCIATE EDITOR

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GLEDITSCHIA TRIACANTHOS.

BY ABRAHAM L. METZ, PH.G.,

Instructor in Practical Pharmacy, Tulane University, New Orleans, La.

THROUGH the kindness of Dr. J. F. Joor, Prof. of Botany of Tulane University, I was placed in possession of a letter from Dr. Claiborne, which gives the exact locality where Mr. Goodman claims to have first obtained the leaves from which he extracted the so-called alkaloid "*stenocarpine;*" and also a description of certain letters alleged to have been cut in the limb of the tree. As everything surrounding the supposed discovery of so valuable a medicament was clothed in mystery, I thought that, by making a personal inspection of the locality, I could possibly discover the marked tree, and clear up the mystery. I have made several further preliminary experiments in obtaining an alkaloidal or other proximate principle from *Gleditschia triacanthos*, the results of which will be seen further on; but, having failed to obtain the supposed anæsthetic, I set out on what proved to be a "wild-goose chase." The information given to Dr. Claiborne by Messrs. Goodman and Seward was to the effect, "that the tree from which they obtained the leaves is on the banks of the Mississippi River, between Donaldsonville and Placquemine, five or six miles from the former place. There are cut in one limb of the tree the letters 'N. P.;' on another, just opposite, 'A. C.'" With this valuable information, I set out for Donaldsonville, on November 22d, for the purpose of obtaining any information on the ssubject, and at the same time make an inspection of the locality.

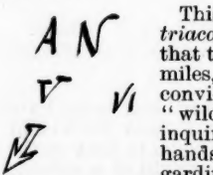
The late Prof. Gustav Robert Kirchhoff.
(See page 2.)

About three miles and a half above Donaldsonville, I met the first clump of trees on the banks. There are several trees, all along the bank, but these are Pecan trees (*Carya oliveæformis* Nutt.). The before mentioned clump of trees consisted of willow trees (*Salix nigra* L.), cottonwood (*Populus angulata* Ait.), and a few trees of *Gleditschia triacanthos* L. These failed to show the described letters.

About five miles above Donaldsonville, there is another clump of trees on the bank. This clump consisted of a few trees of *Gleditschia monosperma* Walt., *Gleditschia triacanthos* L., and such as were described above, and also a few scattered trees of *Catalpa bignonioides* Walt. These also failed to present the described letters, yet every tree was inspected and with *special pains* in regard to the letters said to have been cut in the trees.

About one mile above this clump, there are a few scattered trees of *Gleditschia triacanthos;* on one of these trees, there was a peculiar mark in the form of T, and another mark which appeared to have been obliterated with an axe. There are many scattered trees of *Gleditschia triacanthos* all along the bank, which I inspected for the described letters, but without success.

I still kept on my journey until I was about ten and a half miles above Donaldsonville. There are here quite a number of *Gleditschia triacanthos* trees, every one of which was inspected. On one tree the following marks were cut:



This was upon one of the *Gleditschia triacanthos* trees, and being informed that there were no more trees within five miles, I abandoned my journey with the conviction that it proved, as expected, a "wild goose chase." I then set up an inquiry, and not even the plantation hands could give me any information regarding the gathering of leaves from any tree, or regarding the manufacture of anything along the banks of the Mississippi in that locality by any strange men, or by any one else.

One can rest assured that any unusual manipulations would soon have spread from one to another, had any one seen or heard of the gathering of leaves from any tree. What the negro plantation hands do not see or hear occurring in their neighborhood is not worth while seeing or hearing. However, I learned from an old negro, to use his own words, that "a big, stout man, who said he was a horse-doctor, was in this neighborhood last May." He did not know his name, nor could I obtain further information from any one else in the vicinity. Why the originators of "stenocarpine" first spread the report that they obtained the leaves in West Feliciana Parish, when this parish is quite distant from Ascension Parish (in which lies Donaldsonville and the surrounding country I traversed in my search), is something I cannot understand: on the whole, everything connected with the alleged discovery does not hold together, and has, so far, proved a hoax.

The limited amount of time I have had at my disposal since September 12th was given to the above subject with the results presently to be given. All these experiments, however, are merely of a preliminary character, and on attempt was made to determine the nature of the crystallizable matters found, partly for want of time, as stated before, and partly through deficiency of sufficiently fresh material.

The first trial was upon 180 grammes of leaves, which were not quite dry. They were contused in an iron mortar, macerated for 48 hours, and percolated with a 2% solution of sulphuric acid until perfectly exhausted. The percolate was evaporated to a small bulk upon a water bath, and sodium carbonate added to saturation; quite a bulky precipitate was thrown down, which I extracted with benzene. This benzene solution was washed with acidulated water to obtain any alkaloid present in the acidulated solution. The latter was again super-saturated with sodium carbonate, the solution or mixture shaken with ether, and the latter evaporated spontaneously. As a result, I obtained a varnish-like film with *two small acicular crystals* of a brownish color, the solution of which, after acidulating, gave quite a reaction with Nessler's reagent. The varnish-like film felt resinous to the touch, the taste was slightly bitter, but did *not* possess any anæsthetic properties.

The second trial was made upon 250 grammes of leaves. These were dried in the sun, reduced to a No. 40 powder, macerated for 24 hours, and percolated, with acidulated alcohol to exhaustion. I then distilled off most of the alcohol and evaporated the rest spontaneously until the odor of alcohol was no longer perceptible. The residuary liquid was then super-saturated with sodium carbonate and the liquid extracted with ether. The latter was evaporated spontaneously, and again the result was a varnish-like film, which appeared to have a crystalline structure. The alcoholic solution deposited a large amount of extractive matter, which was filtered off before saturating with sodium carbonate.

The third trial was upon 1,250 grammes of leaves, which were partly dried, contused in an iron mortar, macerated for 48 hours, and percolated with a 2% solution of hydrochloric acid to exhaustion. The percolate was evaporated on a water bath to the consistence of an extract, and an excess of lime added. The mass was thoroughly dried at 140° F., exhausted with a mixture of alcohol and ether, and this solution exposed in a wide porcelain dish to allow it to evaporate spontaneously. As a result I obtained a small quantity of a semi-liquid mass, having a distinctly crystalline structure, but resinous to the touch, and which, when dried in vacuo over sulphuric acid, yielded a yellow powder, which acquired a resinous and adhesive character when exposed to the atmosphere. This yellow powder was examined under the microscope by Dr. J. B. Elliott, Professor of the Theory and Practice of Medicine, Tulane University, when it was found to deliquesce on the slide, showing acicular crystals of a yellowish color.

Thinking that perhaps the product was contaminated with calcium chloride, I dissolved the product in alcohol and added a small quantity of dilute sulphuric acid. This produced a precipitate which I filtered off. I then eva-

porated the alcohol spontaneously, and my result was, as before, a resinous mass with a crystalline structure which, when examined by Prof. Elliott, exhibited the same peculiar phenomena under the microscope.

Assuming for the present that these results point to the presence of a peculiar proximate principle, it seemed to be of interest to ascertain whether a modification of the treatment would make it probable that there were more than one present.

I accordingly prepared a fresh solution, which was made strongly alkaline with ammonia water, and extracted with chloroform. The latter was then evaporated spontaneously, yielding, as a result, a resinous, varnish-like film, with the same peculiar crystalline formation as before described. The liquid residue was exposed to the atmosphere and, after the odor of chloroform was no longer perceptible, the alkaline solution was extracted with ether, and, upon evaporation of the latter, there was obtained a black amorphous residue insoluble in water and chloroform, which appears to belong to the class of resins, but was not further examined.

In another experiment, I used 2 kilos of leaves, dried them, reduced them to a No. 40 powder, using as a menstrum a 2% solution sulphuric acid. I employed the process of repercolation (to avoid the use of heat). The percolate was saturated with gaseous ammonia, which gave a very bulky precipitate; the percolate and precipitate were then extracted with chloroform and the latter evaporated spontaneously. As a result I obtained a semi-liquid mass of a brownish color, showing traces of crystalline structure.

On repeating this process, using only water as a menstrum, the same results were obtained. In every instance, the crystalline matter was observed to be in the form of acicular crystals arranged around a common centre, having a sort of stellate appearance.

The products of all the above processes had a slightly bitter taste, but not the remotest property of an anæsthetic, as I applied portions of each product to the tip of my tongue. A peculiar odor was manifested throughout the different processes of manipulation.

These results may possibly guide those making experiments.

THE LATE PROF. KIRCHHOFF.

PROF. GUSTAV ROBERT KIRCHOFF, of the university of Berlin, died on October 17th at Berlin. His name will always rank among the pioneers of scientific research. In 1859 he announced the important discovery that the Fraunhofer lines in the solar spectrum were due to the existence of elementary bodies in a state of vapor; and that the spectrum differed, not only according to the presence or absence of any of the elements, but also according as the luminous vapor of the element itself was examined, or a ray of white light transmitted through the vapor. In the former case, the spectrum is dark, but traversed by certain colored bands in definite positions. In the latter case, the spectrum is luminous and colored, while the positions of the bands are occupied by exactly coinciding dark lines. This discovery not only opened an entirely new field in chemical analysis, enabling the most minute quantities of elementary bodies to be recognized, but it also led to the discovery of a number of new elements, and revealed much of the nature and composition of the stellar world. In the practical application of his discovery to chemical analysis, he had (while Professor at Heidelberg) the help and assistance of his colleague Prof. Robert W. Bunsen, and, in fact, the perfection of the method, for practical purposes, must be ascribed to these two scientists conjointly. Prof. Kirchhoff distinguished himself also in many other directions upon the field of natural philosophy.

Purification of Syrups by Dialysis.

WHAT is called a "battery of dialyzers" has lately been introduced for the above purpose in Germany; it consists of a series of tall cylinders of fine wire-gauze, open at the top end, but not at the bottom, which is rounded. This gauze is coated on both sides with layers of paper pulp, and the cylinders, arranged in regular series depending from a frame-work above, are plunged into the molasses, juices, or syrups to be purified, and are filled almost to the top with clear water, and allowed to "dialyze" for twelve hours or more. The water (into with a large proportion of the salts contained in the syrups, etc., together with traces only of the saccharine matter, has permeated by "osmosis") is then pumped away through pipes reaching to the bottom of each cylinder, and fresh water pumped in to supply its place. After a further interval this is changed in the same manner, the operation being repeated until the syrup, or whatever fluid preparation is being treated, is considered to be sufficiently purified. This method is, after the first cost of the apparatus, a very simple and inexpensive one, and can be employed either upon a large or a small scale for extracting the salts and other crystalline matters from various chemical and pharmaceutical preparations.

THE UNITED STATES GALLON.

BY PROF. W. P. MASON.

"THE gallon is a vessel containing 58,372.2 grains (8.3389 pounds avoirdupois) of the standard pound of distilled water, at the temperature of maximum density of water, the vessel being weighed in air in which the barometer is 30 inches, at 62° F." (See report on "Weights and Measures" by Secretary of the Treasury, Senate doc. 1857.)

This definition being somewhat obscure, occasion was taken to write to the Treasury Department, from which letter the following is quoted: "Does this wording mean that the 'gallon' is *a volume* equal to that occupied by the above quantity of water under the conditions named; or does it intend a 'gallon' to be understood as meaning the quantity of liquid capable of being held by such standard *vessel* as above referred to, even after such vessel has been expanded by elevation of temperature? I take it that the latter view, although certainly stated, can hardly be intended."

The reply to this came from the office of the "Coast Survey," and read as follows:

"The standard gallon is a measure of capacity or volume. Its capacity was derived from standard weights; and in verifying and standardizing capacity measures, it is the practice to determine the volumes by weighings. It is, therefore, to be understood that the capacity of a gallon is measured by the *weight* of a volume of distilled water at maximum density, whose weight in air, at 62° F.—bar. 30 inches—equals 58,372.2 grains.

"It follows, therefore, that a gallon is the measure of a *constant volume*, and that due allowance must be made for changes of temperature of a vessel used as a gallon measure."

A letter recently coming from the Treasury Department reads:

"The value adopted by this office for the weight of 231 cubic inches of distilled water, at its maximum density, is 8.3389 lbs.; or 8.3316 lbs. at 15° C. This reduced to 60° F. gives a value of 8.3312 lbs."

Desiring to obtain a value in pounds for a U. S. gallon of distilled water at 60° F.—said value to be carried beyond four decimal places—a very surprising degree of confusion was discovered among the authorities.

For instance:

U. S. Pharmacopœia 1870	58328.8862	grains or	8.332698	lbs.
" " 1880	58329.6	" "	8.3328	"
Miller's Chemistry	58317.3	" "	8.3310	"
Am. *Chemist*, vol. i., p. 318	58319.8	" "	8.3314	"
U. S. Treasury Dept.	—	" "	8.3312	"
U. S. Dispensatory (last edition)	58328.886	" "	8.332698	"
Oldberg's "Weights and Measures," page 167	58,335.218	" "	8.333602571	"

From Barnard's "Metric System" we have:

One cubic inch of pure water at 62° F., and under a pressure of 30 inches of mercury, weighs

in vacuo.....252.75965 grains.

Using Kopp's tables (Watt's Dict., vol. iii., p. 58, and interpolating by formula number one), we have:

One cubic inch of water at 32° F. becomes

at 60° F.....1.000769074769 cu. in.
at 62° F.....1.000942703386 " "

Hence:

One cubic inch at 62° F. becomes

at 60° F.....0.9998265349101 cu. in.

Hence:

One cubic inch of water at 60° F. weighs

in vacuo.....252.8035026 grains.

And one gallon (231 cubic inches) weighs

in vacuo.....58397.6091006 grains, or 8.3425155858 lbs.

Referring again to Barnard's "Metric System" we find:

	Grains.
1 cu. in. water at 62° F., in air at 62° F., weighs	252.48843
1 " " dry air " 62° "	0.30908093
1 " " " " " 60° "	0.3102675

Hence:

	Grains.
1 cu. in. water at 62° F. *in air at* 60° *F.* weighs	252.48724343

Now:

One cubic inch of water at 62° F. becomes, as we have seen, 0.9998265349101 cubic inch at 60° F., and the weight of this volume of water at 60° F. is equal to that of the entire cubic inch at 62° F., plus the weight of a volume of air at 60° F., equal to the difference between unity and said volume of water.

Hence:

0.9998265349101 cubic inch of water at 60° F., and in air at 60° F., weighs 252.48729724 grains.

Hence:

One cubic inch of water at 60° F., weighed in air at 60° F., and under a pressure of 30 inches of mercury, weighs 252.53110257 grains.

From these results we obtain for the weight of one U. S. gallon (231 cubic inches) of pure water at 60° F., and weighed in dry air at 60° F. under a pressure of 30 inches of mercury:

58334.68469367 grains, or 8.33352638481 lbs.

RENSSELAER POLYTECHNIC INSTITUTE.
TROY, N. Y., Dec. 9th, 1887.

Note by Ed. Amer. Drugg.—This paper is an outcome of an inquiry set on foot by Prof. W. P. Mason, to ascertain in the first place upon what authority the U. S. Pharmacopœia had based the value in grains there given as being equivalent to a U. S. gallon. This inquiry was addressed to the Chairman of the Committee of Revision, who replied that so far as he was aware there was in reality no *legally* defined standard of measure or relation between weight and measure in existence in this country. A wine-gallon is reckoned as equivalent to 231 cubic inches, and this value had been taken over from the English system, though never expressly defined. The value required to connect weights and measures is the weight of a cubic inch of pure water of a known temperature, at a known temperature and pressure of the air. On looking up all the available authorities, and recalculating the value of a wine gallon, this was found to be

58335.21799875 grains, or 8.33360257 pounds.

In calculating these figures, use was made of the tables in Prof. Oldberg's "Weights and Measures," second edition, (chiefly the table on page 165). The result being communicated to Prof. Mason, the latter followed the authorities further, and in a paper recently read before the American Chemical Society, he reported having calculated and found the value of 1 U. S. Gallon (231 cub. inch.) of distilled water at 60° F. and 30 inches pressure to be

in vacuo.....58397.6091006 grains, or 8.3425155858 lbs.
in air at 60° F. 58334.94640743 " " 8.33356377249 "

This last last value, as will be seen, is very close to the one given by by Professor Oldberg, and that obtained by the writer of this note, and given above. Since the reading of this paper, Prof. Mason has given further attention to the subject, and as a result thereof, he finds it necessary to slightly alter the figures previously obtained by him. The new figures differ, for a value of a gallon of water in grains, only by a little over 0.26 of one grain, affecting only the fifth decimal of a fraction expressing the value in pounds.

Until further information is supplied, the value reported by Prof. Mason deserves preference before all others. It seems, however, highly desirable that this whole question of standards and relation of weight to measure, be finally settled by law, and preliminary to this, by a new scientific investigation which might be most suitably conducted under the auspices of the National Academy of Sciences or some other representative scientific body.

AIR-TIGHT TAPS.

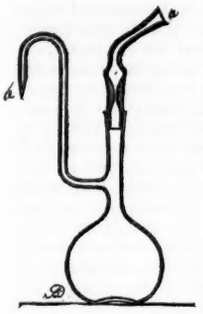
MR ARNOLD EILOART draws attention to the air-tight tap which he devised some years ago, but the best form of which appears to have been overlooked, while others of his invention are quite commonly in use.

The plug of this tap has two grooves, *G G*, running around it, and is used with an ordinary socket, *S*. These grooves, filled with liquid, check any transfer of gas between the exterior and interior of the tap, and, if through bad grinding, such transfer takes place, it is at once detected by bubbles in the liquid. They may be supplemented by vertical grooves joining them in opposite quadrants of the plug-circumference, to stop the passage of gas around the plug, when the tap is turned off.

These taps were originally devised for apparatus used in the analysis of gases, but they will be found useful for various other purposes where an absolutely air-tight stop-cock is required. Another form of air-tight stop-cock, not as serviceable for gas analysis as that just described, but nevertheless useful otherwise, is shown in Fig. II. Here there is a cup-shaped well around the neck of the stop cock, which is to be filled by a suitable liquid [paraffin-oil, etc., etc.]. It will be seen that this form of tap can only be used in an upright position, to prevent the liquid contents of the well from running out. The tap first described, however (Fig. I.), may be used in any position, as the liquid is contained in the grooves.—After *Chem. News.*

Creolin, an antiseptic, oily substance lately introduced, is separated from the tar oil of anthracite coal by treating it with a strong alkali, disengaging the creolin with acid, and distilling it with steam. It forms a milk-white emulsion with water, and in this form may be used as a disinfectant.

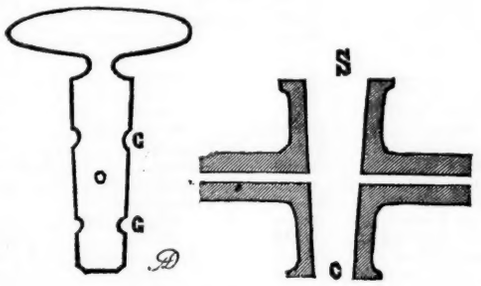
IMPROVED SPECIFIC GRAVITY BOTTLE.



IN the course of a paper on the Analysis of Iron Ore, in the *Chem. News* (Nov. 18th), by A. A. Blair, the author describes his method of taking the specific gravity of the powdered ore, and in connection therewith recommends an improved form of specific gravity bottle. The latter was made with the view of overcoming two difficulties which occur when using the common flask, viz., the expansion and overflow consequent on transferring the flask at 60° F. to the higher temperature of the balance case, and the necessity for waiting until the finely powdered mineral—which was the special object of the author's investigations—had settled before the stopper could be inserted without loss of material. These ends were successfully met by melting on a capillary tubulus to the lower part of the neck, and grinding in a stopper having a small bulb above the capillary, to allow for expansion.

As the author's object was to take the specific gravity of a mineral powder, he had, of course, to insure the complete expulsion of air from between the solid particles. For this purpose he heated the contents of the flasks, after having introduced a weighed quantity of ore and enough water to cover it, almost to boiling by means of a water-bath. Next, the flask was placed under a bell-glass connected with the aspirator, and allowed to boil a few minutes at a reduced pressure. It was then filled with water almost to the tubulus, cooled, the stopper was inserted, and by suction it was then filled slightly above the

FIG. 1.



mark on the capillary part of the stopper. [Suction is applied at *a*, while the tube *b* dips into water.]

The same manipulation is, of course, required when using the apparatus for any other specific gravity determinations.

When it has been filled to the point described by the author, so that it actually holds more liquid than is required at 60° F., the apparatus is put in a place where it will acquire the temperature just mentioned. The level of liquid in the capillary tube is then adjusted exactly to the mark either by touching the orifice of *b* with blotting paper to withdraw any excess, or by presenting to it a drop or two of the liquid to imbibe it.

FIG. 2.

Eiloart's air-tight faucet.

The flask is then dried, transferred to the balance case, and when it has acquired the temperature of the room, weighed.

Antifebrin.

SINCE the first experiments with this valuable remedy performed by Drs. Cahn and Hepp, in Strasburg, antifebrin has been carefully studied by others, and with the same satisfactory results. It possesses the advantage of being low in price, and, moreover, the dose is small, two to ten grs. once, twice, or at most three times a day sufficing to produce a considerable reduction of temperature in cases of typhoid fever, pneumonia, also in erysipelas and acute rheumatic gout. It is given in powders as well as in solution; for the latter mode of administration, it will be found most advisable to dissolve it in brandy, subsequently adding a little water and syrup, as follows: Antifebrin, 1 drachm; brandy, 4½ ounces. Dissolve and add distilled water, 6 drachms; syrup, 6 drachms. One tablespoonful a dose. The remedy is thus rendered very pleasant to take.

A good preparation should be of pure white color, and form moderately large crystals, which are but very sparingly soluble in cold water, rather more readily in hot, and easily in alcohol. Antifebrin melts at 233.6°, and boils at 563°.—*Monthly Mag.*

Table Showing the Yield of Essential Oil as Obtained from Various Plants and Parts of Plants.

MESSRS. SCHIMMEL & Co., of Leipzig, have appended to their fall report on Essential Oils* a very valuable table, showing the *average* yield of essential oil, as obtained, on a manufacturing scale, from a large number of natural products. The original table contains the German name of the crude substance (plant or part of plant), the botanical name and the average yield from 100 kilos. We have omitted the column containing the botanical names, and have re-arranged the table so as to correspond to the English alphabet, but we have appended the botanical source of those substances which are not officinal or less well-known, reference being made to the running numbers of the table. In doing so we have sometimes deviated from the original by giving another botanical name, when this appeared to be more generally recognized by authorities.

As the table comprises only those essential oils which are actually distilled in the works of Messrs. Schimmel & Co., many will be found wanting. Regarding these, statistics must be obtained elsewhere. It may be added that the figures representing the average yield obtained by Schimmel & Co., on a manufacturing scale, are generally larger (in some cases very much larger) than those previously reported by other authorities who work only on a small or experimental scale.

Natural product.	Average yield, per cent.
1 Ajowan Seed	3.000
2 Almond, bitter	0.4–0.7
3 Angelica Root—	
Thuringia	0.750
Saxony	1.000
4 Angelica Seed	1.150
5 Anise Seed—	
Chili	2.400
Levant	1.300
Moravia	2.600
Russia	2.800
Spain	3.000
Thuringia	2.400
6 Arnica Flowers	0.040
7 Arnica Root	1.100
8 Asafœtida	3.250
9 Avens Root	0.040
10 Balsam Copaiba—	
Para	45.000
11 Balsam Gurjun	65.000
12 Balsam Peru	0.400
13 Basil, sweet (herb)	0.040
14 Bay Leaves	2.3–2.6
15 Buchu Leaves	2.600
16 Butter Bur Root	0.056
17 Calamus Root	2.800
18 Canella Bark	1.000
19 Caraway Seed, cult.—	
Germany	4.000
Holland	5.500
Moravia	5.000
East. Prussia	5.000
20 Caraway Seed, wild—	
Germany	6.0–7.0
Norway	6.0–6.5
Russia	3.000
21 Cardamom Seed—	
Ceylon	4.0–6.0
Madras	5.000
Malabar	4.250
Siam	4.300
22 Carrot Seed	1.650
23 Cascarilla Bark	1.750
24 Cassia Buds	1.350
25 Cedar Wood	3.500
26 Celery Herb	0.200
27 Celery Seed	3.000
28 Chamomile, German	0.285
29 Chamomile, Roman	0.7–1.0
30 Chekan Leaves	1.000
31 Cinnamon, Cassia	1.500
32 Cinnamon, Ceylon	0.9–1.25
33 Cloves—	
Amboina	19.000
Bourbon	18.000
Zanzibar	17.000
34 Clove Stems	6.000
35 Coriander—	
East Indies	0.150
Holland	0.600
Italy	0.700
Mogadore	0.600
Russia	0.900
Thuringia	0.800
36 Crisp Mint	1.000
37 Cubebs	12.0–16.0
38 Culilaban Bark	3.400
39 Cumin Seed—	
East Indies	2.250
Malta	3.900
Mogadore	3.000
Syria	4.200
40 Dill Seed—	
Germany	3.800
Russia	4.000
41 Dill Seed, East Ind.	2.000
42 Elder Flowers	0.025
43 Elecampane Root	0.600
44 Elemi Resin	17.000
45 Eucalyptus Leaves	3.000
46 Fennel Seed—	
Galicia	6.000
Saxony	5.0–5.6
47 Fennel Seed, East Ind.	2.200
48 Galbanum	6.500
49 Galangal	0.750
50 Ginger Root—	
Africa	2.600
Bengal	2.000
Cochinchina	1.900
Japan	1.800
51 Heracleum Seed	1.000
52 Hops	0.700
53 Hyssop	0.400
54 Iva Herb	0.400
55 Juniper Berries—	
Germany	0.5–0.7
Hungary	1.0–1.1
Italy	1.1–1.2
56 Laurel Berries	1.000
57 Laurel Leaves	2.400
58 Laurel, California	7.600
59 Lavender Flowers—	
Germany	2.900
60 Linaloe Wood	5.000
61 Lovage Root	0.600
62 Lupulin	2.250
63 Mace	11.0–16.0
64 Marjoram—	
Fresh	0.350
Dry	0.900
~~65~~ Massoy Bark	
66 Masterwort	0.800
67 Matico Leaves	2.400
68 Melissa Herb	0.100
69 Michelia Bark	0.300
70 Milfoil	0.080
71 Mugwort Herb	0.040
72 Mugwort Root	0.100
73 Musk Seeds	0.200
74 Mustard—	
East Indies	0.590
Germany	0.750
Holland	0.850
Italy (Puglia)	0.750
75 Mustard, Russian	0.500
76 Myrrh	2.5–6.5
77 Nigella Seed	0.300
78 Nutmeg	8.0–10.0
79 Nard, Celtic, Root	1.000
80 Olibanum	6.300
81 Opopanax	6.500
82 Origanum (Creta)	3.500
83 Orris Root	0.200
84 Parsley Herb	0.300
85 Parsley Seed	3.000
86 Parsnip Seed	2.400
87 Patchouli Herb	1.5–4.0
88 Peach Kernels	0.8–1.0
89 Pepper, Black	2.200
90 Peppermint—	
Fresh	0.300
Dry	1.0–1.25
91 Pimenta	3.500
92 Pimpinella Root	0.025
93 Poplar Buds	0.500
94 Pyrethrum Herb	0.030
95 Rose, fresh	0.050
96 Rosemary, wild	0.350
97 Rosewood	0.040
98 Sage—	
Germany	1.400
Italy	1.700
99 Sandal—	
East Indies	4.500
Macassar	2.500
100 Sandal, West Indies	2.700
101 Sassafras	2.600
102 Savin	3.750
103 Snake Root, Canada,	2.8–3.25
104 Snake Root, Virginia	2.000
105 Staranise, China	5.000
106 Staranise, Japan	1.000
107 Storax	1.000
108 Sumbul Root	0.300
109 Tansy	0.150
110 Thyme, wild	0.200
111 Turmeric Root	5.200
112 Uva Ursi Leaves	0.010
113 Valerian—	
German	0.950
Holland	1.000
114 Valerian, Japan	
115 Vetiver Root	0.2–0.35
116 Water Drop Wort	1.300
117 Wormseed, Levant	2.000
118 Wormwood Herb	0.3–0.4
119 Zedoary Root	1.300

Notes. 1.—From *Carum Ajowan* Benth. et Hook. (*Ammi copticum* L.—*Ptychotis coptica* et *Pt. Ajowan* DC.)—9. From *Geum urbanum* L.—11. From *Dipterocarpus turbinatus*, Gaert. fil., and other species of *Dipt.*—13. From *Ocimum Basilicum* L.—16. *Tussilago Petasites* L.—24. From the unripe fruits of the Chinese Cinnamon tree.—25. *Juniperus Virginiana* L.—26, 27. *Apium graveolens* L.—28. *Matricaria Chamomilla* L.—29. *Anthemis nobilis* L.—36. *Mentha crispa* L.—38. *Laurus Culilaban* L.—39. *Cuminum Cyminum* L.—40. *Anethum graveolens* L.—41. *Anethum Sowa* Roxb.; but this is identical with the preceding.—42. *Sambucus nigra* L.—44. *Icica Abilo* Blanco (doubtful).—45. *Eucalyptus globulus* Labill.—46. *Fœniculum Panmorium* DC., merely a variety of *F. vulgare* Gaert.—49. From *Alpinia Galanga* Willd. This is the so-called Greater Galangal (Radix Galangæ majoris) obtained from Java. It must not be confounded with the "Lesser Galangal," the root of *Alpinia officinarum* Hance, which comes from China. This contains, according to the Pharmacographia, 0.7 per cent of essential oil.—51. *Heracleum Sphondylium* L., cow parsley.—54. The herb formerly called *Herba Ivæ* or *Herba Genippii veri*, and usually referred to *Iva moschata* Schreb., now better referred to several species of *Ajuga*, chiefly *A. Iva;* also *A. Chamæpitys* Schreb., ground pine, or yellow bugle.—56, 57. *Laurus nobilis* L.—58. *Oreodaphne Californica* Nutt., bay-laurel or spice tree.—60. *Elaphrium graveolens* Kunth? It is now generally, and more correctly referred to species of *Bursera.*—61. *Ligusticum Levisticum* L.—64. *Origanum Majorana* L.—65. Referred to "Massoia aromatica" by Schimmel & Co. The precise source is undetermined. Some species of *Cinnamomum* have been regarded as the mother plant.—66. *Imperatoria Ostruthium* L.—69. *Michelia nilagirica*, according to Schimmel & Co. Probably *Michelia Champaca* L.—71, 72. *Artemisia Abrotanum* L.—73. *Abelmoschus moschatus* Moench. (*Hibiscus Abelmoschus* L.)—75. *Sinapis* (*Brassica*) *juncea* L.—77. *Nigella sativa* L.—79. *Valeriana celtica* L.—80. Various species of *Boswellia.*—81. The source is unknown. Has been referred to *Opopanax Chironium* Koch. (See special note at end of this article.) 82. *Origanum criticum* L.—83. The "oil of orris" is understood to be chiefly myristic acid containing a very small quantity of the essential oil. It is impracticable to separate the latter from the former.—86. *Pastinaca sativa* L.—87. *Pogostemon Patchouli* Pell.—92. *Pimpinella Saxifraga* L., common burnet saxifrage.—93. *Populus nigra* L.—93. In Schimmel & Co.'s list quoted as "Matricaria-Kraut" from *Matricaria Parthenium.* Now generally referred to *Pyrethrum Parthenium* Smith.—95. *Rosa centifolia* L.—96. *Ledum palustre* L.—97. *Convolvulus Scoparius* L., also called "rhodium wood" (see this JOURNAL, 1887, p. 35). The oil of rosewood mentioned in the table, of course, means the true essential oil distilled from this wood, and does not mean the so-called oil of rhodium, which is generally an artificial mixture of several oils.—100. Source unknown. The plant, however, has been ascertained to belong to the family Rutaceæ.—103. *Asarum Canadense* L.—106. *Illicium religiosum* L. Baillon and others now regard this identical with the common star-anise.—110. *Thymus Serpyllum* L.—111. *Curcuma longa* L.—114. *Patrinia scabiosæfolia* Link.—115. *Andropogon muricatus* Retz.—116. *Phellandrium aquaticum* L.—*Œnanthe Phellandrium* Lamb.—119. *Curcuma Zedoaria* Rose.

Note on Opopanax. (By ED. AM. DRUGG.)

Dr. Joh. L. Schlimmer, in his valuable work entitled "*Terminologie médico-pharmaceutique et anthropologique française-persane*," fol., Teheran, 1874 (lithographed), page 410, has the following note on opopanax:

Opoponax; *angl.* opoponax; *allem.* panax gummi; *pers.* djaw-chive. [After giving the statement of Persian authorities as to its medicinal properties, he continues as follows. We translate into English:]

"Dr. Polak [that is, Dr. I. E. Polak, of Vienna, professor at the Persian College] states [O. c. I., 119, and II., 289) that opoponax is the product of *Diplotœnia cachrydifolia*, which occurs in the high mountains extending northwards of Teheran, particularly near Azadbar. The plants when in buds, or the young shoots, are used by the Persian, as a culinary vegetable, both fresh and pickled in vinegar. I have not yet been able to ascertain whether the

* Bericht von Schimmel & Co. (Inhaber Gebr. Fritzsche) in Leipzig. Fabrik ether. Oele, Essenzen und chemischer Präparate. October, 1887. Leipzig.

Opoponax persicum, Boiss., which Mr. Kotchy ('*Abhand. der Geogr. Gesellschaft*') has found near Ostonbagh and Dermeri, in the same mountains, which furnishes opoponax . . . is identical with the *Diplotœnia* mentioned by Dr. Polak."

Note on Mitcham Oils of Peppermint and Lavender.*

THE stem and leaves, or the leaves alone, of the lavender are placed in a huge iron container or still, and covered with water. A fire is then lighted under the container, and when the water in the latter commences to boil, the steam is forced through the only exit, viz., a worm-shaped pipe, which has been fixed to the still before the heat is applied. This pipe runs into a cooling-vat, where it is surrounded by cold water, and then the vapor passing from the still, which carries the essential oil with it, is condensed, the oil at the same time being liquefied. Oil and water together are then drawn from the worm by a tap and left to separate, the oil being subsequently drawn off. The steamed-out part of the plants is put aside, dried in the air, and burnt; but, especially just after the distillery season, the accumulation of this waste product causes much inconvenience. The peppermint oil is usually sold as it comes from the still, this being the cheapest variety; but, in another part of the works, there is a rectifying apparatus in which the more expensive grades of oils are treated, in order to remove the resinous matter and improve the color. The oil which first runs out of this apparatus is placed aside and sold as "triple rectified;" the bulk following forms the second quality, and the remainder is simply "rectified" oil. After each distillation, or if a different material has to be distilled, the container is cleaned, and the odor which still adheres to it is destroyed by boiling water containing alkali in solution. A large proportion of the mint is raised on land belonging to the works, but part of the material is bought from farmers in the neighborhood, and it is said that the acreage devoted to the crop by growers in Mitcham and the surrounding villages is increasing every year. This year nearly 3,000 lbs. essential oil of peppermint were distilled at the Mitcham works, about 360 lbs. being obtained from the white mint—the most-prized variety, which, of course, is always distilled separately. This oil of white mint sells at 45*s.* to 50*s.* per lb., but the cultivation of the white mint is not likely to extend in the same proportion as that of the black—the former only containing about one-half of the percentage of essential oil of the latter. Besides, white peppermint is a crop which is particularly sensitive to climatic influences, and suffers more severely from drought or frost than does the black mint. Of course, the quantity of 3,000 lbs., large as it is, only represents a fraction of the whole of the oil actually distilled at Mitcham. There are several works in that district, and many farmers are in the habit of getting their crops distilled at some of these, paying a royalty for the use of the stills. Lavender is also an important crop in Mitcham. At the distillery which we have described, only the leaves of the plant are placed in the still, the stems being thrown away, as they are thought to render less fragrant the aroma of the oil of the leaf. The lavender crop this season has been about the best for ten years, and nearly 500 lbs. of oil were obtained at the distillery. The proprietors are endeavoring to extend the growing of this crop, and to induce farmers to try the cultivation of new products. Chamomiles were a total failure this year, and only 30 or 40 lbs. of oil were obtained from Mitcham flowers. This had all been sold as soon as it was distilled. We were shown a fine sample of beautiful deep-green color and penetrating odor. Their oil averages from 30*s.* to 40*s.* per lb. in price; but this year the firm were able to make 80*s.* per lb. for the small quantity which they distilled.

Methylal.

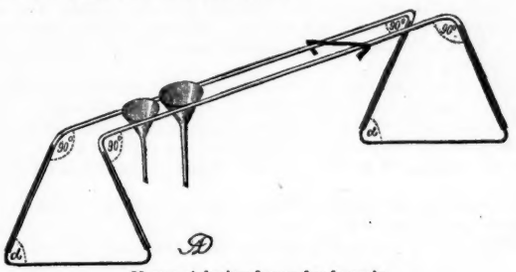
METHYLAL is a soporific of very recent date. It is administered in doses of 20 to 25 grains in water, with a little syrup, thus: Methylal, 1 drachm; syr. orange flower, ½ ounce; water, 1 ounce. One tablespoonful for a dose. It has also been applied externally as a local anæsthetic dissolved in oil, or as an ointment with lard as a base. Both forms are made to contain 15 per cent of methylal. It is a colorless ethereal fluid, which smells like a mixture of chloroform and acetic ether, and tastes pungent and aromatic; it is readily soluble in water as well as in alcohol. The sp. gr. at 59° F. is 0.855; it boils at 107.6°.—*Monthly Mag.*

Hypnon.

BY means of 3 to 8 grain doses of this very powerful soporific, a profounder sleep is produced than that caused by chloral hydrate. It possesses an agreeable [?] aroma, somewhat resembling a mixture of oil of bitter almonds and neroli, but its action on the mucous membrane of the mouth is almost caustic. It is dispensed, therefore, in capsules of gelatin, each of which contains 1 grain of the remedy, combined with 10 of almond oil, to prevent any risk of unpleasant effects. It is a colorless fluid, sparingly soluble in water, more readily so in alcohol, of the sp. gr. 1.032 at 59° F., the boiling point being 410° F.—*Monthly Mag.*

DRYING-FRAME FOR FUNNELS.

AN easily adjustable frame for drying filters contained in funnels is shown in the accompanying cut. It is described by Victor Meurer in the *Zeitschr. f. Anal. Chemie* (1887, 614). It consists of two glass rods bent in the shape of a triangle, and two glass rods bent at each end under an angle of 90 degrees, which ends are slipped over the upward-pointing ends of the triangle. A small glass rod, with in-turned ends, serves to prevent the parallel tubes from spreading. The funnels are simply placed in the rack, and the whole arrangement made of such a size that it will go over a sand-bath.

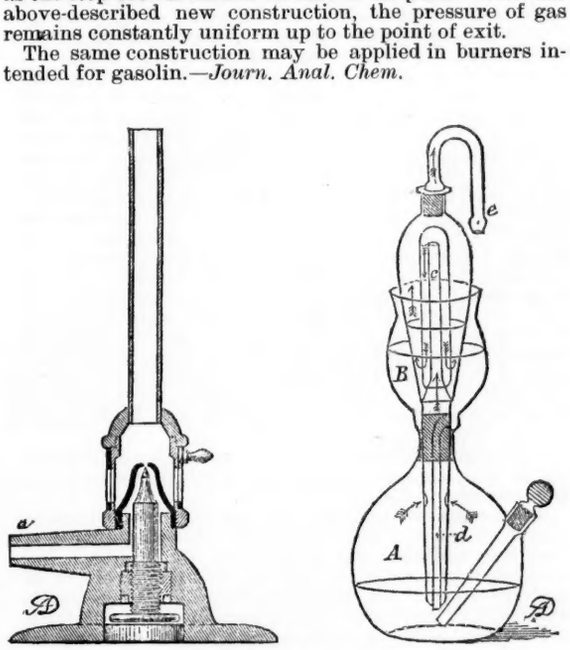


Meurers' drying-frame for funnels.

IMPROVED BUNSEN BURNER.

MR. E. P. VENABLE has constructed a modified Bunsen burner (see figure), in which the exit of the coal-gas, at the place where it mingles with the air, may be regulated by means of a screw at the bottom of the burner. The gas occupies the space surrounding the inner cone, which is adjustable by the screw. If the volume of gas were regulated by a stop-cock somewhere in the inlet-tube *a*, the pressure between the stop-cock and the exit of the gas would constantly vary according as the stop-cock is turned on full or in part. With the above-described new construction, the pressure of gas remains constantly uniform up to the point of exit.

The same construction may be applied in burners intended for gasolin.—*Journ. Anal. Chem.*



AN IMPROVED APPARATUS FOR ESTIMATING CARBONIC ACID.

ROBERT MUENCKE has made some improvements in the usual forms of Geissler's apparatus for estimating carbonic acid.

A is the receptacle for the carbonate. The acid is poured into the cup-shaped neck *B*, and by suitably turning the stopper—which bears the wash-apparatus and delivery, acid is admitted into *A*, through the interior tube *d*. The developed carbonic acid gas passes out in the direction of the arrows, being compelled to pass through the liquid surrounding the inner tube *c*, for the purpose of being washed. When the reaction is completed, air is aspirated through *e*, the stopper in the lower receptacle being removed.—*Chem. Zeit.* and *Chem. Centralbl.*

Saccharin when fused with sodium hydrate is decomposed, and salicylate of soda is contained in the mass formed. This on neutralization with hydrochloric acid yields with ferric salts the intense violet coloration which is so characteristic of salicylic acid. From this it is obvious how saccharin may be detected.

Detection of Vegetable Oils in Cod-Liver Oil.

PROF. E. SALKOWSKI has published a lengthy paper on methods of testing cod-liver oil and vegetable oils in the *Zeitsch. f. Anal. Chem.* (1887, 557–582), from which we take the more important portions.

The author paid special attention to methods by which the presence of *vegetable oils* could be detected. Probably, the conditions of the cod-liver oil trade in some sections of Europe are entirely different from what they are near the sea-coast, or in this country, for it is pretty well known that vegetable oils are of little use for adulterating cod-liver oil, as long as cheap fish-oils, such as dorsch oil, menhaden oil, etc., can be obtained in large quantities, of fair quality, and at low prices. However this may be, Prof. Salkowski's investigations have led to some very interesting results.

Instead of detailing at length the experiments regarding the melting and freezing point of the oil, or the quantity of volatile acid which may be distilled off from the fatty acids of a given quantity of the oil, we will at once state that no useful or practical test could be based on these data.

The author, thereupon, turned his attention to the well-known reaction, which has long been in use as a test of identity for cod-liver oil, namely that produced by mixing the oil with sulphuric acid. This test is best performed in two ways, namely, first, by allowing sulphuric acid to flow into cod-liver oil contained in a watch-glass, and second, by dissolving a few drops of cod-liver oil in chloroform, then adding the sulphuric acid and shaking.* The Pharm. Germ. II. directs a solution of the oil in disulphide of carbon; but Salkowski agrees with Hager, that a chloroform solution is much preferable, as the tints are more persistent. The mixture of sulphuric acid and chloroform solution of cod-liver oil, when shaken, assumes successively the following colors:

1. Violet-blue,
2. Purple,
3. Brownish-red,
4. Deep brown.

This remarkable and well-known reaction, which occurs also when the oil contains considerable proportions of foreign oils, is referred by all authorities to the presence of *biliary* constituents, without the latter having as yet been determined by any one. But the assumption of the presence of these biliary matters in cod-liver oil is altogether unsupported. Buchheim has proven that the oil contains *no biliary acids;* and the above test does not serve for the detection of *bile pigments.* On the other hand, the test has a remote resemblance to that for cholesterin, if the latter is dissolved in chloroform, as Salkowski advises. But it will not be proper to call cholesterin a constituent of the bile (though it occurs therein in small quantities), because it is so widely distributed through nature, and particularly the animal kingdom.

In order to determine which constituents of cod-liver oil produce this reaction, a number of samples (50 Gm. each) of cod-liver oil of different origin were saponified with alcoholic solution of potassa, the alcohol nearly all evaporated, the resulting soap solution dissolved in much water (2 liters), and the strongly alkaline solution shaken with ether. The separation of the ethereal layer requires a long time and can often be completed only by the addition of a little alcohol.

On distillation, the ethereal solution yielded a yellowish residue, which at once congealed to a solid mass, and consisted mainly of *cholesterin.*

By *recrystallization from hot alcohol,* and spreading the crystalline magma upon porous tiles, it was obtained as a brilliant white mass melting at 146° C. Microscopical appearance and reactions proved it conclusively to be pure cholesterin. Its chloroformic solution was perfectly colorless, and gave the typical reaction with sulphuric acid, *without showing the blue tint* which at first appears in cod-liver oil.

The amount of cholesterin in cod-liver oil is rather considerable, certainly much larger than in other animal oils. On an average, it amounted to 0.3 per cent. Regarding the reaction of sulphuric acid with the chloroform solution of cholesterin, the following new observations are given by Salkowski. If the purplish-violet chloroform solution which floats on top of the sulphuric acid is diluted by the further addition of chloroform, it is rendered almost colorless, or intensely blue; but on shaking it with the acid, it returns to its former tint. This is no doubt caused by a trace of water in the chloroform. For, if the purplish chloroform solution is poured into an absolutely dry test-tube, it retains its color; further addition of chloroform renders it light blue, and addition of sulphuric acid and shaking again turns it purplish-violet. If chloroform, which had previously been shaken with sulphuric acid, is used for dilution, no change of color occurs.

We now come back again to the residue obtained after distilling off the ether. If this is *not* recrystallized from alcohol, but at once treated with chloroform, it dissolves to a limpid *golden-yellow* liquid. This liquid assumes a magnificent *blue* color with sulphuric acid, but the blue tint soon disappears and makes room for the other normal cholesterin tints. Since *pure* cholesterin does not yield this blue reaction, but only when it contains the yellow coloring matter, the blue tint must be caused by the action of sulphuric acid upon the *latter.* Now this yellow coloring matter is *not* a bile pigment, because when its chloroformic solution is shaken with solution of carbonate of sodium, it is not taken up by the latter. It belongs to the series of bodies known as *lipochroms* ("fat-coloring matters"), studied by W. Kühne.

The fatty acids of cod-liver oil themselves, are, however, likewise involved in the color reaction with sulphuric acid, as is pointed out by the author.

Hence, the color reaction between sulphuric acid and cod-liver oil is attributable to three causes, viz., *cholesterin, lipochrom,* and *the fatty acids.*

The question now arose, how vegetable oils would behave under the same method of treatment. The author found that a coloring matter, yielding a *blue* tint in chloroformic solution with sulphuric acid, exists *only* in *palm oil,* and here in considerable quantity. Traces are also found in cotton-seed oil, but none whatever in all other oils that were examined.

Cholesterin, on the other hand, was met with in all examined oils, except *palm oil.* This oil is obtained from the *flesh of the fruit.* It may therefore be properly inferred that *cholesterin* is a constituent of all *seed oils.*

The fatty acids obtained from vegetable oils were found not to respond to the reaction with sulphuric acid. A trace of such reaction only occurred with linseed and palm oil.

Now it appeared at first quite doubtful whether the discovery of the true cause of the color reaction could be put to practical use for testing the identity or purity of an oil. On further examination, however, the prospect of utilizing it became much more favorable.

The presence of cholesterin in *vegetable oils* had been known for some time. In 1878, Hesse discovered, in Calabar beans, a substance much resembling cholesterin, and gave it the name *phytosterin.* Concerning this body, other authorities have varied considerably in their views. While Maly did not regard its existence as sufficiently proven, Beilstein (*Handbuch de Org. Chem.* 1st ed., p. 1,377) refers *all* statements of the occurrence of cholesterin in the vegetable kingdom to *phytosterin,* an assumption which Salkowski declares to be exceedingly probable. Maly had pointed out that Hesse's phytosterin may possibly be identical with the iso-cholesterin of wool-fat, and regretted that Hesse had not examined the behavior of the former with sulphuric acid, so as to ascertain whether it gave the same color reactions as cholesterin, or no color at all, like iso-cholesterin. Subsequently, however, Hesse supplied this information, stating that it *did* give the same color reaction as cholesterin.

Since there is no longer any reason to doubt the existence of phytosterin, it occurred to Salkowski that the "*cholesterin*" *of vegetable oils is identical with this phytosterin.* And this turned out to be so in reality.

The two substances, cholesterin and phytosterin (the latter including now the so-called "cholesterin" of vegeable oils) may be sharply distinguished by the following criteria. In the case of

Cholesterin	*Phytosterin*
The hot saturated or nearly saturated alcoholic solution congeals, on cooling, to a magma of crystalline lamellæ.	bunches or groups of solid, and sometimes rather broad needles.
Under the lens, the crystals appear as extremely thin, rhombic plates, frequently with an inturned angle.	long, rather solid needles arranged in form of stars or bunches.
When slowly crystallized the crystals appear (never like in phytosterin)	as handsomely developed, rather elongated, six-sided plates.
When rapidly crystallized (never like in phytosterin)	most of the needles show a characteristic double-pointed free end.
Melting point 146° C.	132–134° C. (according to Hesse, 132°–133° C.).

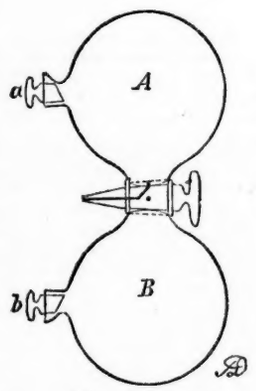
In order to test the practical applicability of the different behavior of these two substances, the author prepared three mixtures of pure cod-liver oil with 20 per cent of rape oil, linseed oil, and cotton-seed oil, respectively, and tested them in the following manner:

10 Gm. of cod-liver oil were introduced into a flask, next 10 Gm. of potassa, dissolved in 10 Gm. of water, were added, and lastly 10 C.c. of alcohol. On shaking and gently heating, the mixture becomes quite hot, and the saponification is completed in a few minutes. The solution is then

* The U. S. Ph. (1880) gives this test in the following language: "On the addition of sulphuric acid, the Oil acquires a violet color, soon changing to brownish-red, and if 1 drop of the Oil be dissolved in 20 drops of disulphide of carbon, and the solution shaken with 1 drop of sulphuric acid, it will acquire a violet-blue tint, rapidly changing to rose-red and brownish-yellow."

diluted with water to 600–700 C.c., and this thoroughly shaken (in a large separator) with about 500 C.c. of ether. After the ether has separated—which requires several hours, but which may be somewhat hastened by the addition of a small quantity of alcohol—the ethereal solution is removed, filtered through paper, if necessary, and the ether nearly all distilled off. Since the residue always contains a trifle of unsaponified fat it should be warmed once more with alcoholic solution of potassa. The resulting turbid solution is then again shaken with a little ether, the ethereal solution removed and washed several times with water in order to remove any traces of soap that might have been taken up by it. It is then evaporated in a deep glass capsule, the residue dissolved (in the same capsule) in hot alcohol, and this solution then evaporated to 1 or 2 C.c., the capsule being covered with a large watch-glass. The soft crystalline magma which separates on cooling and standing is spread upon a porous tile, and after it has been dried, its melting point determined. In *pure* cod-liver oil this was found to be 146° C., while in the three samples purposely adulterated it was regularly between 139° and 140° C. These differences are not large, but, nevertheless, are large enough to form a definite decision.

The author also examined cod-liver oil with reference to the amount of *free fatty acids* it contains. The leading authorities in therapeutics maintain that the presence of free fatty acids in cod-liver oil is one of the most valuable features, inasmuch as these acids, after having passed the stomach, form soaps with the alkali of the bile and the pancreatic juice, and in this form (as soap emulsion) are most readily assimilated. Salkowski has, however, found that all *light-colored cod-liver oil* contains only minute quantities of free fatty acids (0.24 to 0.69 per cent calculated as oleic acid), consequently the above-mentioned theory is not applicable to these oils. Darker colored oils, however, do contain a notable quantity of free fatty acids; one sample examined by the author containing 6.5 per cent. This being the case, it would seem as if the dark cod-liver oils deserved the preference medicinally. On the other hand, their advantages might be neutralized by their bad odor and taste.



Schütze's separator.

[It will be of interest to study the properties of the cholesterin obtained from other fish-oils, not derived from livers, for these are perhaps more commonly used as adulterants of cod-liver oil than any other.]

A FILLING FLASK FOR BURETTES.

ARTHUR STEIN recommends a flask with two tubes for filling volumetric solutions into burettes. If small funnels are used, the liquid is sometimes apt to lose somewhat in strength, particularly if it contains volatile chemicals, such as ammonia or hydrochloric acid. Besides, the new device renders the use of a funnel altogether unnecessary. The arrangement and use of the apparatus are easily intelligible from the cut. The tubes *c* and *d* have a calibre of 5 millimeters; *c* is about ½ inch shorter than the other tube. Hence, when the flask is inclined so as to discharge liquid, the latter will cease to flow as soon as the orifice of the shorter tube is below the surface of the liquid.—*Chem. Zeit.* and *Chem. Centralbl.*

APPARATUS FOR SHAKING AND SEPARATING LIQUIDS.

A VERY handy apparatus, serving as a double separatory funnel, when immiscible liquids have to be first shaken with each other and afterwards separated, has been devised by Robert Schütze. It consist of two glass globes *A* and *B* connected together by a two-way cock. The latter, when in the position shown in the cut, establishes communication between the globe *A* and the exterior, so that a liquid may be drawn off into a suitable receptacle. In the same manner, the globe *B* may be connected with the exterior. If the stop-cock is turned through an angle of 90°, it establishes communication between the globes and shuts off that with the exterior. At *a* and *b* are two tubulures, for charging the globes with liquid.—*Chem. Zeit.*

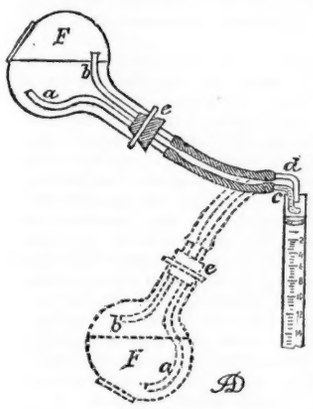
[There is one point connected with this apparatus which seems to bear improvement. That is, the handles of the stop-cock and of the two glass stoppers should all be on one side, so that when the apparatus is held so that the central stop-cock is to discharge any of the within contained liquid, the stoppers may not be liable to fall out, as would seem to be the case with the apparatus shown in the cut.

For support, two common straw-rings will answer.—ED. AMER. DRUGG.]

The Manufacture of Cocaine.

H. T. PFEIFFER gives the following account of his process of manufacturing crude cocaine in Peru and Bolivia.

The disintegrated coca leaves are digested at 70° C. in closed vessels for two hours, with a very weak solution of sodium hydrate and petroleum (boiling between 200° and 250° C.). The mass is filtered, pressed while still tepid, and the filtrate allowed to stand until the oil has completely separated from the aqueous solution. The oil is drawn off and carefully neutralized with very weak hydrochloric acid. A white, bulky precipitate of cocaine hydrochloride is obtained, together with an aqueous solution of the same compound, while the petroleum is free from the alkaloid and may be used for the extraction of a fresh batch of leaves. The precipitate is dried, and by concentrating the aqueous solution a further quantity of the hydrochloride is obtained. Both can be shipped without risk of decomposition. The product is not quite pure, but contains some hygrine, traces of gum, and other matters. Its percentage of alkaloid is 75 per cent, while chemically pure cocaine hydrochloride ($C_{17}H_{21}NO_4.2N.Ch$) contains 80.6 per cent of the alkaloid. The sodium hydrate solution cannot be replaced by milk of lime, nor can any other acid be used for neutralization. Alcohol or ether are not suitable for extraction. A repetition of the process with once-extracted coca leaves gave no further quantity of cocaine, proving that all the cocaine goes into solution by one treatment. The same process serves on the small scale for the valuation of coca leaves. 100 Gm. of coca leaves are digested in a flask with 400 C.c. of water and 250 C.c. of petroleum; the flask is loosely covered and warmed on the water-bath, shaking it from time to time. The mass is then filtered, the residue pressed, and the filtrate allowed to separate in two layers. The oil layer is run into a bottle and titrated back with $\frac{1}{10}$ HCl (1 Gm. of HCl in 100 C.c.), until exactly neutral. The number of C.c. of hydrochloric acid required for titrating back, multiplied by 0.42, gives the percentage of cocaine in the samples. The following are some of the results with different samples of coca leaves of various age:



Stein's burette-filler.

	Per cent of cocaine.	
Coca leaves from Mapiri, 1 month old,	0.5%	of the weight of the dry leaves.
" " " Yungas " "	0.5%	
" " " Mapiri and Yungas, 6 months old,	0.4%	
" " " Cuzco (Peru), 6 months old,	0.3%	
" " " Mapiri and Yungas, 1 year old,	0.2%	
" " " Cuzco, " " "	0.2%	
" " " Mapiri and Yungas, 2 years old,	0.15%	

Coca leaves from Yungas and Cuzco, 3 years old, contained no trace of the alkaloid, whereas fresh green leaves from Yungas contained 0.7 per cent of the weight of the dry leaves. The same process is also applicable for the manufacture of quinine from poor quinine bark, with the single alteration that weak sulphuric acid must be used for the neutralization of the alkaloid petroleum extract. —*Chem. Zeit.*

Cellulose for Finings.

CELLULOSE, in the form of paper and wood pulp, is now being extensively employed on the continent for the clarifying or "fining" of beer, wines, syrups, and pharmaceutical extracts; a little salicylic acid added to the pulp enables it to be kept in the flocculent or damp state without fear of decomposition. This salicylic cellulose seems to answer very well, and its popularity, accordingly, is rapidly increasing on either side of the Rhine.

Synthesis of a Sugar.—Prof. Fischer and Mr. Tafel, of Würzburg, announce that they have succeeded in producing artificially a substance possessing the properties and the composition of a true sugar, differing, so far as at present known, from glucose only by the fact that it is optically inactive.

[ORIGINAL TRANSLATION AND ABSTRACT.]

The Testing of Commercial Sulphate of Quinine.*

DRS. G. KERNER and A. Weller, the well-known authorities on the field of quinine manufacture, have for some time past been engaged in special studies of the recently proposed methods of testing commercial sulphate of quinine, with a view to ascertain whether Kerner's test could not be so modified as to be applicable to the conditions at present prevailing in the quinine market, or whether some other test should be substituted for it. The first portion of their paper was published in the beginning of this year, and in this part it was demonstrated by the authors that the optical method was inapplicable for an *official* test of sulphate of quinine. In the continuation of the paper, which has just reached us, the authors devote their attention chiefly to the ammonia test and its eventual improvement.

When Dr. Kerner first proposed his test—in 1863—the condition of the quinine market was materially different from what it is at present. At that time, manufacturers of quinine worked up, almost exclusively, only South American barks, which contained, besides quinine, chiefly cinchonine and quinidine, while *cinchonidine* was either entirely absent or played only a very inferior rôle. The cuprea barks which flooded the market some time about and after the year 1870, did not contain this alkaloid either. Consequently, the latter occurred but rarely in commercial sulphate of quinine as a natural constituent. Now, the ammonia test was originally designed for detecting the presence of cinchona alkaloids, other than quinine, when *mechanically mixed* with the latter for the purposes of fraud. And, indeed, it never failed to detect this, and it is even to-day capable of showing even the smallest quantities of other cinchona alkaloids when mechanically mixed with quinine.

For a number of years past, however, the cultivated East Indian barks have more and more been drawn upon by manufacturers, and in some of these, cinchonidine exists in very large proportion, often exceeding that of quinine itself. When the latter alkaloid is isolated and crystallized (as sulphate), it is exceedingly difficult to separate the cinchonidine completely from it. The reason is that during the crystallization a double salt of quinine and cinchonidine is formed, which has the property of being either not at all or but slightly split up by cold water. On testing such a sulphate of quinine with the ammonia test (Kerner's test), it had long been known that different results were obtained according as *cold* or *hot* water was used in treating the salt. With *cold* water, nearly every German quinine stood the test perfectly. But when hot water was employed, even the best German quinines required almost always more than 7 cubic centimeters of water of ammonia of spec. grav. 0.960.

[Since reference will be subsequently made to the wording of Kerner's test as given in the U. S. Pharm., we print it here. It will be noticed that the sample to be tested is first deprived of water, in order to ascertain the amount of the latter present. And to avoid waste of quinine by taking a separate sample for Kerner's test, it is directed that the dry residue be taken for this purpose. The passage in the U. S. Ph. reads as follows:

"If 1 Gm. of the salt be placed in a porcelain capsule, and dried at a temperature of 100° C. (212° F.) for three hours, or until a constant weight is attained, the remainder, cooled in a desiccator, should weigh not less than 0.838 Gm. (absence of more than 8 molecules, or 16.18 per cent of water). If the residue thus dried at 100° C. (212° F.) be agitated with 10 C.c. of distilled water, the mixture macerated at 15° C. (59° F.) for half an hour, then filtered through a small filter, 5 C.c. of the filtrate taken in a test-tube, and 7 C.c. of water of ammonia (spec. grav. 0.960) then added—on closing the tube with the finger and gently turning it until the ammonia is fully intermixed, a clear liquid should be produced. If the temperature of maceration has been 16° C. (60.8° F.), 7.5 C.c. of the water of ammonia may be added; if 17° C. (62.6° F.), 8 C.c. may be added. In each instance, a clear liquid indicates the absence of more than about 1 per cent of cinchonidine or quinidine, and of more than traces of cinchonine."]

Since the detection of cinchonidine by means of the officinal test depends upon the greater solubility of its sulphate compared with quinine sulphate, it follows that in a case where the two alkaloids have been crystallized together, and where *cold* water is used for preparing the test-liquid, the sample may be found apparently free from cinchonidine, while if *hot* water had been used, the latter alkaloid might have been easily detected.

The authors quote a series of parallel experiments, made with cold water and with water at 60° C. upon the same samples of commercial sulphate of quinine, which show conclusively that the use of *cold* water for preparing the test-liquid fails to reveal a large proportion of the cinchonidine. The following table shows the results:

Ammonia Required.

Number of Sample.	Test with cold water.	Test with water at 60° C.
1	5.45 C.c.	10.00 C.c.
2	5.50 "	10.00 "
3	7.55 "	10 75 "
4	6.20 "	9.50 "
5	5.80 "	6.40 "
6	6.45 "	8.35 "
7	6.40 "	11.75 "
8	6.65 "	12.70 "
9	6.35 "	10.80 "
10	6.30 "	11.50 "
11	7.00 "	15.00 "
12	7.05 "	13.50 "
13	5.35 "	10.25 "
14	6.80 "	13.00 "
15	6.90 "	11.20 "

It will be seen from this that, of all the samples which appeared to stand the test when *cold* water was used, only a single one stood it with *hot* water. The fact that the two series of figures are not proportionate to each other is simply due to the varying amount of splitting up of the double salt of the alkaloids, which does not always take place uniformly. The authors, therefore, declare that the test is unsuited for a quantitative determination of "latent" cinchonidine, though it may serve as such for the alkaloid when mechanically mixed with the quinine salt.

The occurrence and influence of "latent" cinchonidine may be shown still more prominently by a synthetic method—namely, by applying the test *first* to mechanical mixtures of the two sulphates, and afterwards to another portion of the same mixture, previously raised to boiling and again cooled.

		Requires ammonia.
1.	Normal Quinine Sulph..... .....3.50 C.c.
2.	do., mixed with 5% Cinchonidine Sulph..13.00 "
3.	do., do., and boiled..... .....6.15 "
4.	do., mixed with 10% Cinchonidine Sulph...insol. *
5.	do., do., and boiled.....12.70 "

Under favorable circumstances, even larger percentages of cinchonidine may become latent and escape the test.

In order to make the ammonia test applicable to the kind of quinine at present available in the market, it is in the first place necessary to direct the sample to be treated with water at such a temperature as will be certain to split up any double salt of quinine and cinchonidine that may be present. Besides, the quantity of ammonia may be regulated according to the degree of purity which the officinal salt is required to have. It has been demonstrated that, when perfectly pure sulphate of quinine is extracted with cold water, as directed by the test, it does *not* require 7 C.c. of ammonia to dissolve it. In fact, the authors have found, from a large number of careful experiments, that an absolutely chemically pure sulphate of quinine, treated with water at 15° C., furnishes a solution, 5 C.c. of which require *only* 3.4 to 3.5 C.c. of water of ammonia of spec. grav. 0.960 for precipitating and redissolving the quinine. If, therefore, the market could be supplied with chemically pure sulphate of quinine, the preceding figures would represent the proportions to be used in the test.

The authors point out that sulphate of quinine may be regarded as absolutely chemically pure if, when treated with *any* proportion of cold water (insufficient for its complete solution), it always yields solutions requiring exactly identical amounts of ammonia for the end-reaction, and if these results remain unaffected even by repeated recrystallization of the salt and applying the test to the several mother-liquors.

The proposition had already been made by other experimenters, to modify the test by using hot or boiling water. But the authors, aware that too high a temperature would be liable to introduce other drawbacks, made a series of careful experiments to determine the most suitable temperature. In the course of these experiments it was found that the *size* of the crystals in which the salt exists exerts a considerable influence upon the amount of cinchonidine entering into solution.

This error may be avoided either by reducing the sample to powder, previous to macerating it in water, or to drive out the water of crystallization by exposure to a gentle heat (40–50° C.). The latter temperature is preferred by the authors to one at 100° C. (212° F.), because in the former case there is obtained a stable salt containing 2 molecules of water. On drying at 100° C., this is dissipated, but is again gradually reabsorbed by exposure to damp air.

The objection has been raised that if a temperature higher than 15° C. is used for maceration, the resulting solution is liable to be supersaturated. Although it is not likely that this can occur while a notable quantity of undissolved crystals are still present in the liquid, yet it has been found that there is some change produced in the salts, so far as to render them *basic*. That is, even a

* Abstract of a paper by Dr. G. Kerner and Dr. A. Weller, entitled "Prüfung des käuflichen schwefelsauren Chinins," in the *Archiv der Pharmacie*, 225, pp. 712-738. Received as pamphlet from the authors.

* Even a very large excess of ammonia was unable to produce a clear solution.

short heating appears to separate a small proportion of the alkaloids in a *free* state. This may be shown by treating a sample of sulphate of quinine with ether, which will take up only faint traces of the salt, while the same agent will extract a notable quantity of free alkaloid, after it has been heated with water. However, the authors do not regard this as a valid objection, but state that any error resulting from this cause is avoided by allowing the mixture of water and sulphate of quinine to cool during a sufficiently long time.

In order to study the effect of time in cooling, normal or chemically pure sulphate of quinine was used—the same which required 3.4 to 3.5 C.c. of ammonia. One part of this was dissolved as far as possible in 30 parts of boiling water, then cooled, and portions of it tested with ammonia at stated intervals. One series of experiments was made so that the solution was allowed to cool in the air, and the respective sample was placed in a water-bath at 15° C. only half an hour before being tested. In the other series, the hot solution was at once transferred to the water-bath at 15° C., and left there until a sample was tested. The samples of the first series are quoted under the letter *a*, those of the second series under *b*. The figures indicate the amount of ammonia required:

Duration of Cooling.	Cooled in Air and Water. *a*	Cooled in Water. *b*
½ hour	—	5.35 C.c.
1 "	6.20 C.c.	4.85 "
2 "	5.60 "	4.30 "
3½ "	—	3.95 "
4 "	4.90 "	—
4½ "	—	3.85 "
5½ "	—	3.70 "
6 "	4.60 "	—
7 "	4.30 "	—

It will be seen that a perfect return to the constant titer possessed by the original sample requires a considerable time; but nevertheless it takes place much more quickly if the hot solution is at once cooled by being placed in cold water, 5½ hours being required to reach the original titer pretty closely, while in the other case 7 hours were insufficient to approach it even as far as the other.

The return to the original titer, however, is reached still more quickly by taking *less water*, and using a lower temperature for maceration. The following table gives the results of experiments made with 2 Gm. of partly dried sulphate of quinine (with 2 mol. of water) and 20 Gm. of water, four different sets of experiments being made at different temperatures, the time of heating being half an hour. In the sets quoted under *a* and *b*, the temperature was 100° C., in *c* it was 60° C., in *d* heat was not used at all, the salt being only macerated (and occasionally stirred up) with water at 18° C. during 5 hours. The samples were cooled as follows: *a* first in the air, and the portion to be tested cooled in a water-bath at 15° C. during half an hour preceding the test; *b*, *c*, and *d* were cooled by being at once placed into water at 15° C. The figures again denote the quantity of ammonia required:

Duration of Cooling.	*a* Digested at 100° C.	*b* Digested at 100° C.	*c* Digested at 60° C.	*d* Macerated cold.
½ hour	—	6.50	5.40	—
1 "	8.30	—	4.40	3.50
1½ hours	—	—	3.90	3.55
2 "	—	5.20	3.40	—
3 "	—	4.40	3.45	—
3½ "	—	—	3.55	3.50
4 "	—	—	3.50	—
6½ "	5.00	—	3.55	—
7½ "	4.30	—	—	—
18 "	3.45	3.50	—	3.50

From this it appears that a temperature of 60° C., and a cooling in water at 15° C. during two hours, is perfectly sufficient to obtain the correct titer, while, if boiling water is used, a constant titer is reached only after the lapse of a long time.

Upon the basis of the several experiments here outlined, the authors give the following modification of the test:

Modified Kerner's Test.

Allow the sample of sulphate of quinine to effloresce completely by exposure to a heat of 40–50° C. (104–122° F.); then put 2 Gm. of it together with 20 Gm. of distilled water into a test-tube, place this in a water-bath at a temperature of 60–65° C. (140–149° F.), and allow it to remain therein for half an hour, repeatedly shaking up the contents. Then transfer the test-tube to a water-bath at 15° C. (59° F.), and leave it in this for two hours, agitating the contents frequently and strongly. Care is to be taken that, before withdrawing the tube for the purpose of filtration, the temperature of the water-bath shall have been as near as possible to 15° C. (59° F.). [Then quickly filter through pure paper-filters of 7 centimeters diameter.] Transfer 5 C.c. of the filtrate to a test-tube, and add just enough water of ammonia of spec. grav. 0.960 to cause the resolution of the separated quinine. The quantity of ammonia required should not exceed ... cubic centimeters."

The authors temporarily left the amount of ammonia blank, as they were not fully prepared to make a definite proposition. While they themselves advocate a certain degree of purity in the commercial sulphate quinine, and while they feel that neither they nor other honest manufacturers need be suspected of seeking a justification for a low grade of quinine, by arguments against too high a degree of purity, they decidedly differ in opinion from those who want to reject quinine containing more than 1 per cent of cinchonidine, because they believe this to be against the interests of the consumers themselves. The removal of the last percentages of cinchonidine is a very expensive process. And the consumer alone has to pay for this without having the least benefit therefrom, or even without positively improving the medicinal power of the product. A quinine of such a degree of purity would cost about 15 per cent more than the commercial kind. The authors state that the best brands of quinine, for some time past, contain between 2 and 6 per cent of "latent" cinchonidine, which is not a worthless diluent, but is therapeutically nearly identical with the quinine itself. Regarding the ammonia titer, the authors state that, while chemically pure sulphate of quinine requires only 3.4 to 3.5 C.c. of water of ammonia, a mixture of 97 parts of sulph. of quinine and 3 parts of sulph. of cinchonidine requires 4 C.c., and a mixture containing 7 per cent, 6 C.c. of ammonia. Yet these figures are valid only for mixtures of the chemically pure salts. The commercial salt contains sometimes other substances, such as hydroquinine, which have a modifying effect upon the quantity of ammonia.

[We do not agree with our friends Drs. Kerner and Weller in their argument against strict purity of the commercial sulphate of quinine. While we are fully aware of the difficulties in the way, and without being puritanical theorists, we yet believe that sulphate of quinine should be put on the market in as pure a condition as it can be prepared. What if the price should be 15, or even 25 per cent higher? Quinine is so low now that few would feel this advance. We have paid this additional 25 per cent for the impure commercial quinine not a very long while ago. Why should he be unwilling to pay the same price now for a pure article? We believe the time will come when the pure quinine will be in chief demand. One of the principal objections to it has been the supposition that it could not be prepared in the light feathery condition in which the ordinary public has been accustomed to see and purchase it. As prepared from the bisulphate, it is indeed usually obtained in heavy, hard crystals. Yet a method of preparing it in a light condition has been found and announced not long ago. Hence this objection is no longer valid.—Ed. Am. Dr.]

The execution of the test as described above is very simple. The sample of quinine may be allowed to effloresce by exposure in a warm place, or this may be accomplished by means of a water-bath at 60–65° C. While the sample is in the cold-water bath, it is not necessary to keep this constantly and exactly at 15° C.; it is only desirable that it shall be as close to this temperature as convenient, and it is even preferable that the temperature shall be rather a little over 15° C. than below this. But special care must be taken that during the 15 or 30 minutes preceding the removal of the sample for filtration, the temperature shall be exactly 15° C. A difference of temperature of only 1° or 2° C. may raise the ammonia titer by ¼ to ¾ cubic centimeter. After the mixture has stood the proper time at the required temperature, a portion of the liquid is passed through a small dry filter—7 centimeters in diameter—the filtrate usually amounting to more than 10 C.c., so that there is enough for two titrations. If desired, the filtration may be performed by means of a small aspirator. If sulphate of quinine is digested with water at 100° C., the mixture forms after cooling such a thick magma that it is difficult, even with an aspirator, to obtain 5 C.c. of filtrate. This is an additional reason why the authors prefer a temperature of 60–65° C. For the same reason it is necessary to employ 2 Gm. of the salt and 20 Gm. of water, since if only 1 Gm. of salt and 10 Gm. of water are taken, it is often difficult to obtain 5 C.c. of filtrate.

The water of ammonia must be exactly of the specific gravity 0.960 at 15° C. The titration is best performed in this way, that the *whole allowable quantity of ammonia is added at once*, in order to ascertain whether the sample will come up to the accepted standard, which is really the practical question to be decided. If it is then desired to find the limit up to which ammonia can or must be added so as to still produce a clear liquid, this may be done with another portion of 5 C.c., to which the ammonia may be added in small portions. The end reaction is easily recognized by the fact that, upon being *once* gently turned over, the liquid shows only a faint opalescence, which disappears either at once or within one or two seconds on turning the test-tube over once more. The *disappearance of the opalescence* is the important criterion, and no attention need be paid to any small, solitary specks floating about in the liquid. These specks consist of hydrate of quinine, and are formed now and then in

minute quantity, particularly if the ammonia was added too slowly or in too long intervals. They may form in solutions of pure or impure quinine, but are always present in too small a quantity to have any influence upon the end-reaction. [The appearance of these specks may, however, be entirely prevented if, instead of the weaker ammonia (spec. grav. 0.960), the stronger (spec. grav. 0.920) is used. One of the authors had always advocated the use of the latter, but it appears that there are good reasons why the weaker ought to be preferred.] If the preceding details are observed, it is easy to obtain concordant results, though, of course, there will be cases where differences of 0.1 to 0.15 (and even 0.2) C.c. will be observed. In the case of normal or pure sulphate of quinine, or such as had the sulphate of one of the other alkaloids mechanically mixed with it, the end-reaction is much more sharply recognized. Finally, the authors point out that the duration of heating the sample (one-half hour) is to be observed as nearly as possible; while the cooling may be protracted for any desired period, as long as it exceeds two hours.

The authors append a number of analytical figures to show how the amount of ammonia required varies with samples of varying composition. It being impossible to prepare mixtures with pre-determined amount of latent cinchonidine—for, even if exactly known quantities of the two alkaloids are crystallized together, they will not each time form the same quantity of double salt—the only way by which the authors could exactly determine the relative *true* proportions of the two alkaloids was by means of the optical method, based upon that of Oudemans.

For this purpose the effloresced salt was used in each case, the quantity employed corresponding as nearly as possible to 0.746 Gm. (or $\frac{1}{1000}$ molecule) of the anhydrous sulphate. This quantity was dissolved in 6 C.c. of normal hydrochloric acid, diluted to 20 C.c. at 17° C., and the polarizing angle determined in a 200 millimeter tube in Laurent's polarimeter. According to the formula $[\alpha] = \frac{\alpha \cdot 20}{2 \cdot p}$, in which p represents the weight of *anhydrous* sulphate of quinine used, the following values were found as the means of a long series of determinations:

1, for chemically pure sulphate of quinine $[\alpha] = -237.71$
2, for chem. pure sulph. of cinchonidine $[\alpha] = -149.27$

By means of these constants the relation of the two salts in various artificially prepared mixtures was determined as follows:

Number of Mixture	Polarizing Angle (α)	Per cent of Cinchonidine in the anhydrous salt	Per cent of Cinchonidine in the hydrous salt	Amount of Cinchonidine originally added.*
1	−235.8	2.2%	2.1%	2%
2	−235.2	2.8%	2.6%	4%
3	−234.7	3.4%	3.2%	6%
4	−231.5	7.0%	6.8%	10%
5	−231.1	7.5%	7.27%	10%
6	−229.1	9.7%	9.1%	20%

From the figures in the last columns it appears that with increased admixture of cinchonidine increased amounts of the latter become latent, though the proportions are not always the same.

The six samples, thus exactly determined, were now titrated with ammonia in the manner above described, and the following results obtained:

No.	Containing sulphate cinchonidine	Tests made with hot water			With cold water
		I.	II.	III.	IV.
1.	2.1%	3.90– 3.95	3.75– 3.75	3.75– 3.75	3.60–3.55
2.	2.6%	3.90– 3.85	3.80– 3.80	3.90– 3.90	3.75–3.80
3.	3.2%	4.20– 4.30	4.20– 4.30	4.30– 4.25	3.95–4.00
4.	6.8%	5.45– 5.45	5.50– 5.55	5.40– 5.40	4.50–4.50
5.	7.2%	6.35– 6.35	6.30– 6.35	6.30– 6.25	5.10–5.10
6.	9.1%	10.70–10.60	10.65–10.70	10.60–10.60	5.80–5.85

The titrations agree well among themselves. The quantity of ammonia in general increases with the percentage of cinchonidine, but in a more rapid proportion than the latter. Differences of one-half per cent of cinchonidine can be detected by this method only with difficulty, but differences of one per cent with certainty. If less than 1.5 or 2 per cent of cinchonidine is present in a latent condition, its detection becomes doubtful or impossible. But this limit of sensitiveness is perfectly sufficient for an official test. The figures in column IV. were obtained when the samples were macerated in cold water, and are appended only to again show the insufficiency of this solvent.

[If sulphate of cinchonidine were the only impurity occurring in sulphate of quinine, it would follow from the preceding figures that the test of the U. S. Pharm., if modified so as to use hot water for maceration, would permit the presence of about 7.5 per cent of sulphate of cinchonidine, and *not* one per cent. But, as cold water is directed by the U. S. Ph., the test really permits the presence of a still larger quantity. In reality, however, cinchonidine is *not* the only contamination.—ED. AM. DR.]

The authors, among other interesting facts (which we are compelled to omit) mention the proposition of Schaefer, to dry sulphate of quinine at 100° C., as this is able to break up the double salt, so that the latent cinchonidine becomes recognizable, whereby the ammonia titer is raised. They acknowledge that the latter is to some extent the case, but they also point out that Schaefer's proposition had long been anticipated by the U. S. Ph., where the salt is directed to be dried at 100° C.

It is now pretty well established that there is probably no commercial sulphate of quinine which does not contain some proportion of *hydroquinine* and probably also *hydrocinchonidine*, as sulphates. Hesse has found that 5 C.c. of a solution of sulphate of hydroquinine saturated at 15° C. require not less than 25 C.c. of ammonia of spec. gr. 0.960. In this respect, therefore, it shows a considerable similarity to cinchonidine. But the sulphate of hydroquinine resembles the latter still more in this respect, that it may form a double salt with sulphate of quinine, in which it is no longer detected by the officinal test (with cold water as macerating liquid), or which influences the ammonia titer but very slightly.

1.	Normal sulph. quinine	required ammonia		3.5 C.c
2.	do	with 5% sulph. of hydroquinine,	mixed	" 14.4 C c.
3.	do	with 5% "	boiled	" 4.0 C.c.
4.	do	with 10% "	boiled	" 6.5 C.c.

Hence, mechanically—added hydroquinine is easily demonstrated, but that which has been crystallized with the quinine is present in a latent form.

The modified ammonia test, however, is fully capable of revealing its presence, as the hot solvent helps to split up the double salt. The influence of the hydroquinine upon the ammonia is about of the same extent as that of cinchonidine.

Since commercial sulphate of quinine often contains a considerable proportion of sulphate of homoquinine—the authors have frequently found 4 to 7 per cent, and even in so-called Chininum sulfuricum *purissimum* they have sometimes found 2, 3 and 4 per cent—it will, of course, exert its influence upon the test. A portion of the titer of commercial sulphate of quinine, which even in the best brands is usually higher than 7 C.c., is, therefore, to be placed to the account of homoquinine. But as this latter alkaloid should not be regarded as a contamination of quinine (it certainly deserves this name much less than cinchonidine), it is but fair to make a corresponding deduction from the titer. The authors think that no great error will be committed if 1½ to 2 C.c. of the ammonia are credited to homoquinine, and simply deducted from the titer.

If it is, however, desired to detect, and approximately determine, the homoquinine, this may be done by means of permanganate of potassium in the following manner: Dissolve five grammes of sulphate of quinine with the aid of a little sulphuric acid in one-half liter of cold water, and add cautiously a dilute solution of permanganate, until a drop placed on a white surface, and touched with a drop of permanganate, does no longer discolor the latter at once, but allows it to retain its color for a short time. Then filter, wash the maganese oxide remaining on the filter with some water, and shake the united filtrates with ether and ammonia. On evaporating the separated ethereal layer (previously washed), the hydroquinine will remain, and if it is pure, may be recognized from its resistance to the action of permanganate. Should it be affected by the latter, this would show that it is still accompanied by undecomposed quinine. In this case the process would have to be repeated.

* Namely, to the sulphate of quinine before dissolving and crystallizing the mixture.

The Preparation of Infusion of Digitalis.

M. BROEKER, army pharmacist at Utrecht, has recently published a paper on the infusion of digitalis in the *Nieuw Tijdschrift voor d. Pharmacie in Nederland.* He shows that the preparation of this infusion presents certain difficulties which it is well to be aware of, and it becomes nowadays a very important matter to know exactly how much active principle is contained in the different preparations daily met with.

The author recommends pharmacists only to use the parenchyma of the leaf in making infusion of digitalis. This parenchyma contains, he says, about 1 per cent of *digitaline*, whilst the stalks and nerves of the leaves only contain about 0.02 per cent of the same active principle. These, the writer says, should be discarded. Moreover, his experience teaches him that, by leaving the stalks and leaf-nerves, the infusion becomes gelatinous.

With regard to the temperature of the water, and the time it should be allowed to remain in contact with the leaves, M. Broeker finds that a maceration of two hours' duration with water at a temperature of 20° C. gives the best result. The infusion may also be made at a temperature of 70° C., but the result is less satisfactory. [We do not approve the recommendations of the author, because they will necessitate an entire change of adjustment of the dosage of this much-employed preparation. —ED. AM. DR.]

The author says that the same remarks apply perfectly well to making infusion of senna; the best therapeutic preparation is that in which the infusion is obtained by macerating the leaves for two hours with water at a temperature of 15° to 20° C.—*Monthly Mag.*

Quinine Mixtures.

As regards the solution of quinine in acids, the fact that the mineral acids, strong or dilute, make presentable pill masses indicates that they should not be poured upon the quinine, but that the latter should be well diffused in water before acids are added. Very often, however, no acid is ordered in the prescription. In such a case it is extremely unwise to depart from the letter of the physician's order. The only admissible manner of compounding is to reduce the quinine to fine powder, and diffuse it in the liquids. In some cases, as when spirit of ether is an ingredient, the quinine in this form may tend to adhere to the bottle; but this may be avoided by the addition of a little mucilage of acacia to the mixture. Some dispensers advocate that the quinine should be dissolved in such circumstances, and the view is one for which there is much to be said; but in all cases quinine in solution is much more bitter than when in suspension, and this fact throws the balance of opinion in favor of the suspension method. The greater number of difficulties with quinine mixtures occur through the precipitation of the quinine after it has been brought into solution. The simplest of these, apart from those due to the action of ordinary alkaloidal precipitants, are caused by the formation of less soluble salts owing to double decomposition. For example, ammonium acetate may induce a precipitate. Apparently, nothing is to be dreaded by the mixture of a solution of quinine with spirit of mindererus; but it so happens that acetate of quinine is one of its least soluble salts, although it dissolves readily on heating, and in certain proportions it is possible to get a mixture of an alkaline acetate and quinine sulphate perfectly solid owing to the formation of quinine acetate. Salicylates also form sparingly soluble compounds with soluble quinine salts. The most intractable results are those caused by alkaloidal precipitants. The more common of these which are found associated with quinine in prescriptions are the alkaline carbonates and hydrates, iodides and (from them) iodine, perchloride of mercury, and infusions or tinctures containing tannin. In all circumstances these substances precipitate the quinine as insoluble compounds, which in most cases are adhesive. The alkaline hydrates and carbonates precipitate quinine as hydrate, and there is no means of avoiding the precipitation. English prescribers appear to be fonder of ordering the alkalies—generally in the form of aromatic spirit of ammonia—with citrate of iron and quinine than with the plain salts of quinine, probably under the impression that the spirit does not affect the stability of the double citrate. Under the same impression, probably, ammoniated tincture of quinine is sometimes directed to be diluted with water. In this tincture, quinine exists as hydrate dissolved in alcohol, and when the alcohol is reduced to a certain point the quinine falls out of solution. The only way to make presentable mixtures in such cases is to dilute the alkaline solution well, and in the case of other compounds of quinine than the ammoniated tincture, the alkaloidal solution also, adding to the latter mucilage of acacia in the proportion of half a drachm to each ounce of the finished mixture; then mix the two solutions. In this way the quinine is deposited in a fine state of division, and, although it subsides, the precipitate is readily diffusible on shaking, which is not the case if the mucilage is not added, so that it may be considered an admissible alteration of the pharmacy of the prescription, and should therefore be noted thereon for the benefit of the next dispenser. Iodide of potassium forms variable compounds with solutions of quinine salts. Neutral solutions of quinine and iodide of potassium do not react chemically, but the presence of free acid invariably induces a chemical change, and this is increased if there is any substance in the mixture—such as nitric acid or spirits of nitre—which liberates iodine. It is seldom that herapathite is formed—a brown compound of quinine iodide, and free iodine being generally the product. If possible, the dispenser should communicate with the prescriber in such cases, so as to suggest the exclusion of the oxidizing body; failing that, the reaction between the iodide and oxidizing body should be carried out with as small a quantity of iodide as possible, and in a perfectly full phial. The rest of the iodide should be mixed with the quinine and mucilage mixture before the iodine solution is added to it. Bromides present no difficulty with quinine solutions, and it is seldom, fortunately, that perchloride of mercury is prescribed with quinine. The precipitate which it causes is a heavy one, and without something to suspend it, it is possible that the patient might get an excessive quantity of the quinine mercurate in the last dose. Some vegetable infusions containing tannin, particularly the acid infusion of roses, form abhorrent-looking mixtures with quinine, owing to the precipitation of quinine tannate. In these cases, it is best to use pure quinine in proper proportion rather than the sulphate, so that chemical reaction may be reduced to a minimum. Apart from the examples which are given, other kinds of difficulties occasionally occur. In all cases, however, the dispenser has only to adhere to the principles that (1) chemical reaction should be effected in the most dilute solutions, and (2) a means for the proper apportioning of the dose should be adopted; for the latter mucilage of acacia is not only generally suitable, but it has also been shown to retard or modify chemical reaction. Hence the necessity for adding it to the quinine solution before the reacting element.—*Chem. and Druggist.*

Note on Emulsions.*

NOTWITHSTANDING that the balance of opinion is greatly in favor of acacia for emulsions, there are still those who hold to tragacanth and continue to recommend it. This is matter for surprise, for the more fully we know the perfect character of acacia emulsions the more completely do those of tragacanth pass into the shade. Tragacanth gives magmas rather than emulsions; you can easily incorporate oils with it, but examine the product and you will see the oil globules are of a coarse character, visible to the unaided eyes. The difference obtainable by the two gums may reasonably be attributed to their difference of constitution. In a tragacanth emulsion, the swollen colloid bassorin appears to have the power of preventing the globules of oil coalescing, not by virtue of viscosity, but rather by providing an obstacle to the movement of the oil. On the other hand, a perfect acacia emulsion has each particle of oil surrounded by an envelope of soluble gum, both together forming a cell, having enough resistance to prevent coalescence with contiguous cells. At this point I am constrained to make a few remarks on the cod-liver oil emulsion of the "Unofficial Formulary," made as you know with tragacanth. Like Conroy, my attempt to make a good emulsion of it was a failure. The oil is well suspended, but badly divided. It would have been better, as Conroy suggests, to have made it with gum acacia.

Tinctures of senega and quillaia have remarkable properties as emulsifying agents, because of their power, in very small quantity, of dividing and pulverizing substances where gums fail. If you place in a bottle 1 oz. of chloroform, 20 minims of tincture of senega, and a few drachms of water, shake well, and make up to 5 oz. with water, you get a product in which the chloroform is divided into an immense number of globules; these globules readily subside, but will rest for hours without breaking down. Mercury, ether, or any essential oil can be divided in the same manner. Mr. H. Collier ("Year-book of Pharmacy," 1879) gives some formulæ for senega-made emulsions; they are useful for hospital work, where time allowed for work done is much too brief. In private dispensing, senega will never be regarded with favor, as its emulsions are too temporary in character.

The flavoring and preservation of emulsions ought not to be overlooked. Although an emulsion may be therapeutically and mechanically perfect, it is often nauseating to the tase and offensive in odor. Flavoring, though only an adjunct, still does contribute elements of value to a medicine. The common favorites among flavors are those used in cookery, such as the volatile oils of almond, cinnamon, cassia, cloves, lemon, the essence of vanilla, and orange-flower water. My opinion of these as regards permanency, palatability, and power to disguise is in favor of almonds. An elegant cod-liver oil emulsion is made as follows: (The weights and measures are British.)

Cod-liver oil	4 oz.
Powdered gum acacia	1 oz.
Oil of cassia	4 minims.
Oil of almonds (volatile)	4 minims.
Saccharin	2 grains.
Water to make	8 oz.

Mix the oils with the gum and saccharin in a dry mortar, add 2 oz. of water, stir till the emulsion is formed; finally, add sufficient water to make 8 oz., then mix well.

Castor-oil is well disguised in the following formula:

Castor oil	1 oz.
Powdered gum acacia	3 drachms.
Oil of almonds (volatile)	2 minims.
Oil of cloves (volatile)	1 minim.
Saccharin	1 grain.
Water to make	4 oz.

Mix the oils with the gum and saccharin in a dry mortar, add 4 drachms of water at once, stirring till the emulsion is formed, dilute to 4 oz. with water.

Having saccharin at our disposal provides us with a useful substitute for sugar in emulsions. Its advantages are that it adds nothing to the thickness of the product, and cannot give rise to fermentation. The method found most convenient for using saccharin is a 10-per-cent solution made by adding bicarbonate of sodium till effervescence ceases; 20 grains of saccharin take 8 grains of the soda salt.

To keep emulsions for long periods is not desirable; they are best freshly made. Should it be desired to preserve them, recourse must be had to such antiseptics as boric or salicylic acid, or, better, perhaps, a simple tincture of benzoin, or even pure chloroform. The latter is a most powerful antiseptic, imparting an agreeable sweetness; 1 minim may be added to each ounce of emulsion.

* From a paper by Mr. A. W. Gerrard, F.C.S., teacher of Pharmacy to University College, London, in the *Chemist and Druggist.*

Improved Preparation of Oxyiodide of Bismuth.

VARIOUS methods have so far been proposed to prepare this compound, but there appears to be a disadvantage in the character of the solvent, viz., nitric acid, which is generally used to bring the bismuth into solution. Mr. O. Kaspar proposed to neutralize the injurious effects of the solvent by using very dilute solutions, which introduced another drawback, namely, that in the preparation of larger quantities of the salt, very large volumes of liquid were required to be handled. Mr. Bernhard Fischer has lately proposed to replace nitric by acetic acid. His process is the following :

95.4 parts of crystallized nitrate of bismuth are dissolved with the aid of a gentle heat, in 120–150 C.c. of glacial acetic acid (96% acid), and this solution is poured, under stirring, into a solution of 33.2 parts of iodide of potassium and 54.4 parts of crystallized acetate of sodium in 2 to 3 liters of water. Each portion of the bismuth solution, poured in, causes a greenish-brown precipitate, which, during the first stage of the operation, assumes, on being first formed, a lemon-yellow color, which, on further addition of bismuth passes more and more into brick-red.

The precipitate is washed first by decantation, then on the filter, and dried at 100° C. The oxyiodide of bismuth thus prepared is in form of a bright brick-red powder, containing on an average 67.21% of Bi_2O_3. Mr. O. Kaspar reviews this process, on the basis of new experiments, and says that there is some loss of iodine involved, as the liquid poured off from the precipitate contains this body in a free state. He also points out that the product becomes paler and more yellowish on exposure to light. Hence it ought to be kept in the dark.

Aplantesis.

THIS is a new term proposed by Prof. J. W. Mallet for a peculiar separation of a solvent from the dissolved substance upon an increase of temperature.

Prof. Mallet had made the observation that in an alcohol thermometer, the liquid contents of which were colored with cochineal, the upper part of the liquid column appeared *colorless* when the temperature increased, while at no other portion of the colored liquid column could there be seen any separation of coloring matter. It therefore appeared as if the alcohol had separated from the dissolved substance by mere expansion.

The author next examined aqueous and alcoholic solutions of various colloidal substances, such as starch, tannin, caramel, albumen, and gelatin. The experiments were conducted in flasks holding about ½ liter, and closed with corks through which passed a glass tube of 4 millimeters bore, and 15–20 Cm. long, provided in the middle with a glass stop-cock. Each flask was filled with the respective liquid until the latter stood in the glass tube a few centimeters below the stop-cock. The solutions had been carefully filtered through several layers of paper, so that they were absolutely free from any suspended matter. The flasks were then cooled for some time with ice, and next placed in a moderately warm room, until the liquid had risen, in consequence of its expansion, a few centimeters above the glass stop-cock. The latter was then carefuly closed, the liquid above the stop-cock taken out by means of a capillary pipette, and examined for the quantity of dissolved substance contained therein. A portion of the liquid remaining in the flasks was also examined for the purpose of comparison. In all cases it was found that the portion removed by the pipette contained a more or less diminished quantity, and in some cases even none at all, of the originally dissolved substance.

The only explanation which the author can suggest for this phenomenon—which he proposes to call *aplantesis*—is this, that the solvent passes through between the molecules of the substance and thus becomes separated from it. A similar separation of colloids from their solvents, though in an opposite sense, takes place when the former gelatinize on cooling.—After *Chem. News.*

[*Note by Ed. Am. Drugg.*—The explanation given by the author amounts to this, that a certain number of molecules of the solvent—which are originally homogeneously distributed throughout the liquid, and uniformly mixed with the molecules of the substance dissolved—at an increase of temperature become detached from their place of lodgment and pass upwards between the superincumbent molecules of the solid and the solvent. To how great a depth this process can extend is not shown, but it would seem that, at least in narrow tubes, it may extend to a depth of one or even more centimeters. According to the author's theory, this separation is purely mechanical, and the separated molecules may be assumed *to remain at rest when they have arrived in the uppermost layer*, where they will be soon joined by others similarly disembarrassed of their former solid companion-molecules. But the question may be asked, Have such phenomena ever been observed in solutions prepared with *non-volatile* or *very difficultly volatile* liquids? If it shall be found that the phenomenon takes place only when the solvent is readily or moderately *volatile*, then an explanation may be found in the fact that the solvent, even at low temperatures, is slowly vaporized, and if inclosed in tubes such as described by the author, probably recondensed, falling back again and gradually collecting as a pure layer on the surface. It need not be assumed that the same molecules of liquid which are already thus collected as a layer, are the only ones which continue to be vaporized and recondensed, but it may readily be imagined and conceded that the loosening or starting action of an increase of temperature upon the molecules of the solvent may extend some distance downward from the surface. Beyond a certain depth, of course, the weight of the superincumbent column will counteract the tendency of the molecules to float upward. Consequently, it may be assumed, that fresh molecules from below the pure layer already collected, will constantly be thrown upwards with the others, whereby the layer of pure column will gradually increase up to a certain point. Then it might be asked, will not the superincumbent pure layer gradually diffuse itself again with the remainder of the liquid, thus reproducing the original uniform and homogeneous solution? The answer to this would be, that if the apparatus remains as it was, the action would probably go on continuously. The lower portion of the "pure" layer would gradually and constantly diffuse with the main body of the solution, while new layers of still purer liquid will collect on top, the purest of all being that which just reaches the surface, freshly condensed.]

Strophanthus.

THE British Consul at Zomba (East Central Africa) gives the following notes which he has obtained from Mr. Buchanan, in reference to this plant:

"Strophanthus is considered the most powerful poison the natives possess. It is found at a low level, and, as far as I can gather from personal observation and native sources, is not to be had on the high land. The supplies hitherto obtained have been drawn from the right bank of the River Shiré, below the Murchison Rapids. There is, apparently, more than one species, or, at least, variety; the distinguishing feature being a much smaller pod and fewer seeds. At present, information relative to these other varieties is scant. The Strophanthus is a strong climbing plant, and is always found in the vicinity of high trees, on which it supports itself. The stem varies in diameter, but has an average of a few inches. It lies on the ground in folds, the branches supporting themselves on the nearest trees. The young branches have a rod-like habit, and are in appearance not unlike elder; the fruit grows in pairs, and has a peculiar appearance, very like a pair of immense horns hanging on a slender twig. The fruit begins to ripen in July, and lasts till the end of September. Judging from the few plants I have reared here, it would appear to be a strong growing plant. The natives are quite ignorant of its age, or how old a plant may be before it bears fruit. The native method of preparing the poison is very simple. They first clean the seeds of their hairy appendages, and then pound them in a mortar until they have reduced them to a pulp. A little water is then added. To the pulp is then added the bark of a tree containing a gummy substance which helps to keep the poison on the arrow, in event of its striking against a stone. The poison thus prepared is spread upon the arrow and allowed to dry; game wounded by arrows poisoned with strophanthus die quickly. The flesh is eaten without evil effect. The only precaution taken is to squeeze the baobab bark on the wound made by the arrow, and this counteracts the evil effect of the poison. Buffalo and all smaller game are killed by this poison.—*Times.*

Opium and Ether—After-Effects Avoided.

IT frequently happens—more often, indeed, than not—that the administration of opium is attended with so many symptoms of the undesirable kind, such, for instance, as sickness, nausea, headache, and general interference with the digestive functions, that its use is necessarily abandoned or restricted on this account. Dr. A. G. Auld, of Wick, N. B., has lately discovered a plan whereby the valuable action of opium may be obtained without incurring any of the ill effects before alluded to. The method is a simple one, consisting merely in giving along with the tincture of opium (supposing this to be the preparation of the drug prescribed) an equal, or even a rather larger, proportion of spirit of ether. The latter stimulates the action of the alimentary canal, and the secretive organs generally, and thus neutralizes the effect produced upon these by the opium alone, while not interfering with its powers in any other respect. We trust that other practitioners will repeat Dr. Auld's practice with this valuable, yet much abused narcotic, as this method of getting all the good effects thereof, without any of its evils, cannot be too widely known or too greatly imitated.—*Monthly Mag.*

Prof. Bloxam, of London, well known as the author of a much-used and practical treatise on general chemistry, and several works on analytical chemistry, died on November 29th, 1887.

Insect Remedies.

THE report on entomology made by W. B. Alwood to the Columbus Horticultural Society, last winter, states that many remedies were employed on the two described cabbage worms, consisting of alum water of different degrees of strength, tansy water, tomato water, benzine, coal-oil emulsions of different strengths, Hammond's slug-shot, Cayenne pepper, half a dozen remedies from England, several preparations of tobacco and pyrethrum. None proved of any value, except the tobacco soaps and pyrethrum. The tobacco soaps, prepared with potash, were quite efficient, the value of which was ascribed to the potash. Pyrethrum is recommended as the best remedy, being perfectly safe, easy of application, and more deadly on the worms than any remedy used. Powder of good quality, mixed with three times its bulk of flour, was found perfectly effective, applied with a dusting-bellows. One pound, costing 50 cents, was enough to cover an acre, if properly handled.

Chinese Trade Guilds.

THOSE who think that the "cutter" is something new under the sun will be interested in the following account of how this evil is taken care of by the Druggists' Guild of Wênchow:

"From days of yore to the present, all occupations have commenced their organizations by establishing regulations, to be subject to modifications by time and circumstances. Accordingly, we of the drug trade, in the reign of Hsien Fêng (having previously been divided into two guilds), united and formed a compact body, without reconciling old and new rules, and, therefore, for the past ten years irregularities have occurred necessitating their codification. Consequently we assembled and agreed on the new rules here subjoined. Henceforth they are to be conformed to in their entirety; their violation, when discovered, will entail the penalty of two plays and liquor and viands for over twenty persons. This notice is given to caution against infringement of the following laws:

"It is agreed that all accounts shall be settled at each of the three terms of the year.

"It is agreed that deductions of 5 per cent be allowed for cash payments, but not on credit transactions.

"It is agreed that when a member is in debt to another, and transfers his dealing to a third party, the Guild shall bring the three members together, and that he shall not be allowed to trade with the latter until he liquidates his debt to the former.

"It is agreed that a member who allows a customer a higher rate for dollars than their market value for the day shall be mulcted.

"It is agreed that a druggist newly commencing business shall pay an initiation fee to the treasurer of the God of Medicine Temple; if failing to pay up the due amount in full, the member who transacts trade with him shall be fined to the full extent of the deficiency."—From a report by United States Minister to China, DENBY, to the Department of State on "Chinese Guilds."

Sandal-Wood.

FROM an article by David Hooper, in the *Chem. and Drugg.* (Nov. 26th), we take the following note on sandal-wood:

The chief article of commerce in Mysore, and the most important item in the forest revenue, is the sandal-wood. The *Santalum album* is from thirty to sixty feet high, with not a very robust habit; the color of the stem is darker than that of the figs and cassias in its vicinity; the flowers are small and red, but neither the bark, sap-wood, leaves, nor flowers have that fragrance which is found in the duramen or heart-wood. The sandal is propagated by seeds; and, as both the wood and the tree are a government monopoly, the fruits are carefully collected by servants, whether from forests or from the compounds of private houses. Natural-grown sandal is being attended to by having a system of special men, called "sandal-monegars," to look after their cultivation, as there is a doubt if the artificially-grown trees will have the same amount and quality of fragrance as the self-sown. The wood is sold by auction once a year, the larger portion being purchased by merchants of Bombay. Until the sales, it is stored in depots called "Kotes," situated in several towns in the province. Mysore sandal is appreciated above all other kinds, especially in the China market, and it has a steady net price of 45 l. per ton at the place of production, showing it to be the most valuable wood in the world. During the year 1886-1887, a better sale of the wood realized about 46,000 l.—a substantial increase to the Mysore forest revenue of 1 lakh of rupees, or 10,000 l., over the sales of the previous year.

Dispensing under Difficulties.—Pharmacist Aidmajor Lahache, a graduate of the Paris College of Pharmacy, writing from Biskra, the southernmost point of civilized Algeria, relates some of the difficulties encountered by the pharmacist who tries to follow the French Cordex near the Sahara desert. "After May," he says, "it is hardly possible to dispense an ointment or a salve in Biskra, both lard and vaseline remaining always constantly liquid; mercurial ointment separates into two layers, one quite fluid and transparent, and the other semi-liquid, but holding still the metal in suspension. Cocoa butter is useless, so are suppositories; the temperature of the human body being during the day inferior to that of the atmosphere, any composition that would be solid before introduction would not melt in the cavities for which such medicaments are intended, a state of things contrary to all pharmaceutical ethics. Woe to the pharmacist who would leave unstoppered any bottle of ammonia, collodion, or tincture! Crystallized sulphate of soda begins to liquefy in June, to become solid again only in September. The same is the case with carbolic acid. Adhesive, gold-beater's skin, and court plasters cannot be used. Infusions, decoctions, and emulsions spoil in a few hours. Licorice-root has to be rejected and replaced by glycyrrhizin. All india-rubber instruments must be abandoned. Some pill-masses cannot be made at all; for the others the excipients are to be altered, and what is worse, the familiar pill-machine, owing to the dilatation of the brass plates, either have their grooved portion bulging out of shape if the wooden frame is strong enough, or the wood cracked when the metal is stronger. The only drop of comfort is that ready-made solutions can be kept in stock at a degree of concentration impracticable in our climates. Such are boric acid, sodium borate, salicylic acid, and hypodermic solutions in general." As to the feelings of the pharmacists under such conditions, they may readily be imagined; no doubt he wished he had never left the green banks of the Seine.—*Chem. and Drugg.*

French Toilet Preparations.—In a report submitted to the Hygienic Council of Paris by Drs. Dubrisay and Chafin, the authors state that the perfumery and toilet products now sold contain so many noxious substances that it is desirable the factories should be placed under special surveillance. They give a number of instances in support of their statement. The so-called "harmless and purely vegetable" hair dyes, they say, are all poisonous. "Progressive dyes" are ammoniacal solutions of nitrate of silver. The "instantaneous dyes" are a solution of litharge in lime water. "Eau des Fées" is a solution of sulphate of lead in hyposulphite of soda. "Eau Figaro" consists of three solutions (1) of nitrate of silver and sulphate of copper; (2) sulphide of sodium; (3) cyanide of potassium (to remove the silver stains). "Eau des Fleurs" is composed of rose water, 95.5; flowers of sulphur, 2.7; acetate of lead, 2.8. Passing to cosmetics, they say "Lait antipellique" is composed of corrosive sublimate, 1.7; oxide of lead, 4.22; sulphuric acid and camphor. "Lait de Manille" is a mixture of borax, copper, tincture of benzoin, and essence of bitter almonds; "Lait de Ninon," of bismuth and zinc; "Eau Magique," oxide of lead and hyposulphite of zinc; "Eau de fleur de lys," protochloride of mercury; "Eau royal de Windsor," glycerin and oxide of lead; "Eau de Castille" hyposulphite of soda and acetate of lead. The "Poudre Pilivore de Laforet" contains mercury (?),60 grs.; sulphide of arsenic, 30 grs.; litharge, 30 grs. and starch, 30 grs. "Epiteine" is simply sulphite of calcium, and "Antiboldos" hypophosphite of soda. Pomades against baldness all contain cantharides and croton oil.

Some Phases of the Trade in Eau de Cologne.—IT is doubtful whether any article of commerce of the same proportion has given rise to so many lawsuits as the eau de Cologne industry generally, and more especially the respective degree of "genuineness" of the countless "Farinas" who are engaged in the manufacture of the perfume. In the early years of the present century, Cologne numbered sixty makers of the perfume, most of whom carried on business under the style of "Farina," having secured a bogus partner of that name in Italy, where in some provinces the patronymic is almost as common as are Brown, Jones, or Robinson in this country. A poet of the period went so far as to assert that—

> . . . Chaque jour le Rhin vers Cologne charrie
> De nombreux Farina, tous "seuls," tous "Jean Marie;"

a verse which might be rendered in doggerel English as follows:

> The Rhine towards Cologne does every day carry a
> Number of Farinas, each "genuine John Maria."

The export trade in eau de Cologne is said to date from 1760, when, during the Seven Years' War, the French temporarily occupied Cologne. They carried away samples of the perfume to their own country, where it became very popular. At present Great Britain and the United States are the best foreign customers for the article.—*Chem. and Drugg.*

The new German Spirit Tax which went into effect on October 1st had induced foreign dealers to lay in as large stocks as possible previous to its introduction, so much so that the price advanced considerably from this excessive demand alone. Of course, since the tax as gone into effect, the price of the commodity has proportionately advanced, but is not quite settled yet.

Camphor Ice.—Spermaceti, 3 ounces; white wax, 4 ounces; oil almonds, exp., 8 ounces; camphor, 4 ounces; oil cajuput, 40 drops; oil lemon, 2 drachms.

Philicome Pomade.—Wax, 10 ounces; rose oil, 1 pound; sweet almond oil, 1 pound; cassia, jasmine, and tuberose oil, of each half a pound; oil of orange, essential, 1 drachm. Dissolve the wax in the rose and almond oil, and add the other oils as it cools, stirring all the time. ["Oil of Jasmine" is an alcoholic tincture made from the "pomade."]

Fluid Philicome.—White wax, 1 ounce; rose oil, 1 pound; oils of cloves, ½ drachm; bergamot, 1 ounce; lemon, ½ ounce; lavender (English), 2 drachms. Dissolve and mix.

Royal Windsor Pomade.—Lard, 2 pounds; spermaceti, 2 ounces; wax, 1 ounce; cassia pomade, 4 ounces; olive oil, 1 pound. jasmine oil (French), 3 ounces. Beat up well. Perfume: Oil of bergamot ½ ounce, oil of cloves, 1 drachm; oil of cinnamon (Ceylon), ¼ ounce.

Oleine for Darkening the Hair.—Tannic acid, ½ drachm; glycerin, 2 drachms; oil of sweet almonds, 6 drachms; oil of neroli, 2 drops; oil of orange peel, 20 drops. Mix.

Castor-Oil Pomade.—Yellow wax, 3 ounces; castor oil and olive oil, of each, 16 ounces. Perfume, 1 ounce.

Convenient Glue.—Gelatin is dissolved in the water-bath in its own weight of strong vinegar, a quarter part of alcohol and a very little alum is then added. This glue, it is said, will remain liquid, and is much used for cementing mother-of-pearl, horn, etc., upon wood or metal.

Still Another suggestion for an adhesive gum for labels. It is a modification of the tragacanth paste which is so useful for mounting botanical specimens. Soak 30 Gm. of tragacanth in a little water until it is fully swelled, beat it up to the consistence of a thick homogeneous mucilage, and mix this with a mucilage made from 120 grammes of acacia, and pass the whole through a piece of "tammy." Add to this 120 C.c. of glycerin, in which 2.5 grammes of powdered thymol has previously been shaken up, and lastly make the whole up to 1 liter by measure.

To Remove Dandruff and Promote the Growth of Hair.—No. 1. The following is found to be very efficacious:—Acet. canthar., 2 drachms; aromatic vinegar, 2 drachms; spirit of rosemary, 2 drachms; elder-flower water, ad 4 ounces. Well sponge the roots of the hair every morning, and brush with a moderately hard brush. Or No. 2.—Ether, 1 ounce; tinct. of cantharid., 1 ounce; alcohol, 1 pint; rose oil, q. s. Well shake, and apply with a moderately hard brush at bedtime.

Bronchitis Cure (Dr. Dobell).—Carbonate of ammonium, 35 grains; wine of ipecac, 2 drachms; spirit of chloroform, 1 drachm (1 to 7); paregoric, 2 drachms; water, ad 8 ounces. Mix. One tablespoonful three times a day, or oftener if the cough is troublesome.

Neuralgia Powders.—Take of quinine, 16 grs.; carbonate of iron, 1 ounce; Dover's powder, 40 grs.; jalap, 40 grs.; essence of peppermint, 15 drops. Mix, and divide into eight powders, one to be taken twice a day.

Toothache Remedy.—E. S. Kirk finds that the ordinary paste used for filling hollow teeth, for the purpose of "deadening" the nerve, does not fulfil its purpose fully. He, therefore, recommends (in the *Dental Cosmos*) the following, which is said to be satisfactory in every respect:

Arsenious Acid	2 parts.
Hydrochlorate of Cocaine	2 "
Menthol	½ part.
Glycerin	enough to make a paste.

We give the above with the reservation that we deem it a *dangerous* compound for indiscriminate use. The application of arsenious acid or of compounds containing this to any portion of the fauces or interior of the mouth has more than once led to very serious results, even under professional supervision.

Elixir of Terpin.—Vigier recommends the following mixture for the administration of terpin or terpin hydrate:

	Gm.	One dose.
Terpin (hydrate)	0.500	gr. 8
Glycerin	7.000	fl. ʒ 1½
Alcohol	7.000	fl. ʒ 2½
Syrup of Honey	7.000	fl. ʒ 1½
Vanillin	0.002	gr. 1/30

—*L'Union Pharm.*

Note.—Syrup of honey (*Codex*) is prepared by mixing 4 parts of honey with 1 part of distilled water, heating to a boil, clarifying, and straining.

Syrup of Saccharin.—The *Rundschau* gives the following proportions: Dissolve 10 parts of saccharin with 11 parts of carbonate (or 12 parts of bicarbonate) of sodium in 1,000 parts of distilled water at a temperature of 104° F.

Corn-Salve.—Black oxide of copper, 15 grains; lard, ½ oz. Mix well with aid of heat. After paring the corn as closely as possible, apply the ointment once daily.

Castor-Oil Mixture.—Gherman, a Roumanian apothecary, recommends the following combination which he improperly calls an emulsion. The taste of the oil is well disguised in it. It contains about 30 per cent of alcohol, which may make it unsuitable for administration in certain cases.

	Gm.	
Castor Oil	30	1 fl. oz.
Alcohol	15	5 fl. dr.
Syrup of Rhubarb	20	½ fl. oz.
Oil of Peppermint	drops 2	2 drops.

Mix and shake thoroughly.

A Natural Wine Containing Iron.—The wine grown at La Seyne, Department Var, France, is probably the only one so far known which contains more than traces of iron naturally. This is, no doubt, due to the peculiar condition of the iron in the soil. On analysis, the wine was found to contain in 1 liter:

Alcohol	67.54 Gm.
Extractive	20.50 "
Acid (calculated as sulphuric)	6.20 "
Ash	2.60 "

Among the latter 0.11 Gm. of ferric oxide. The usual quantity of iron found in wine varies from 0.01 to 0.02 Gm. per liter.—*Journ. Pharm. et Chim.*

Standardizing Volumetric Solution of Permanganate.—In place of oxalic acid, which is usually employed, the tetroxalate of potassium has recently been recommended by R. Ulbricht, because its solution may be kept a long time without deterioration. Fresenius, who quotes Ulbricht in the *Zeitsch. f. Anal. Chem.*, 1887, 629, points out that this salt has been recommended already in 1856 by K. Kraut, and that the latter has used it ever since with the greatest satisfaction.

Benzol in Whooping Cough.—Dr. J. Lowe highly recommends benzol as a remedy for whooping cough. To deprive the benzol somewhat of its hot, burning taste, and to prevent it from causing nausea, he advises it to be administered in a viscid mixture, and in small doses, usually in quantity of three or four minims. Yet even smaller doses are effective, and for a child of 4 or 5 years of age two minims every two hours will be sufficient. The following mixture is recommended by him:

℞ Benzol. puriss.	♏32
Glycerini	fl. ʒ 1½
Ol. Menthæ pip.	♏10
Syr. Mori	fl. ʒ ½

M. A teaspoonful every two hours.

[In place of syrup of mulberries, some other pleasant syrupy vehicle, such as syrup of raspberries, may be used.]—*Brit. Med. Journ.*

Oleate of Atropine in Suppositories is recommended by J. F. Brown, of Dover, England, as a substitute for extract of belladonna. Ten grains of atropine dissolved in a half-ounce of oleic acid and diluted with oil to a fluid-ounce and twenty minims, will form a solution of which each minim will represent one grain of the extract.—*Pharm. Journal.*

Test-Paper for Oxygen.—According to Wuerster (*Ber. Deutsch. Chem. Ges.*), a most delicate reagent for active oxygen, even when the latter is present only in traces, may be prepared by saturating paper with a solution of tetramethyl-paraphenylen-diamide. This substance is rendered of an intense violet color when coming in contact with oxidizing substances. Hence it will indicate active oxygen, either in a free state or in combination. It has been found perfectly indifferent towards other substances, and will, therefore, be preferable to other reagents for active oxygen.

Antipyrin may fairly be considered the most popular of modern antipyretics. The dose varies from 15 to 30 grains, twice, three, or more times a day. For children 3 to 12 grains will be found to be sufficient. It is of great value in all febrile diseases, reducing temperature very promptly. Of late it has been applied in subcutaneous injections as a local anæsthetic. In some cases a bright pink rash, like nettle rash, will suddenly appear during treatment; this is considered to be of no importance, as it causes no inconvenience, and soon disappears.

Antipyrin is readily soluble in water and alcohol; it possesses but little flavor, and that not unpleasant, and is, therefore, adapted for administration in solution. It thus possesses great advantages over quinine, especially in treating children, who take it very readily if mixed with a little syrup, thus: Antipyrin, 80 grains; simple syrup, 1 ounce; water, add to 4 ounces. Two teaspoonfuls for a dose.

It crystallizes in colorless laminæ, which melt at a temperature between 230° and 235.4° F.—*Monthly Mag.*

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FREDERICK A. CASTLE, M.D.....EDITOR.
CHARLES RICE, PH.D.....ASSOCIATE EDITOR.

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ITEMS.

The National Pure Food Convention will hold its second session in Washington, D. C., in Willard's Hall, beginning Thursday, January 19th, 1888, at 12 o'clock.

All national, State, commercial, mercantile, agricultural, health, and other organizations favoring the enactment of a judicious national anti-adulteration act, which will supplement those of various States and municipalities by reaching imported commodities, interstate transactions, and territory exclusively under the jurisdiction of the United States authorities, are invited to send one or more delegates, not exceeding three in number, to this convention. Editors of trade and other journals favoring this object are also invited to attend as delegates.

Headquarters of the committee will be at Willard's Hotel. Organizations electing delegates will please communicate names of same to Elisha Winter, Secretary, 213 East 23d Street, New York, and any suggestions as to the welfare and conduct of the convention to Newton Dexter, Chairman Committee of Arrangements, Albany, N. Y.

Cincinnati College of Pharmacy.—The number of those who have already signified their intention of attending the spring session of the Cincinnati College of Pharmacy (which will be inaugurated in March next), and the letters of inquiry received, indicate that there will be a very full attendance.

Georgia.—The Governor has appointed the following-named gentlemen to serve as a Pharmaceutical Examining Board for the State, for the term of three years: J. W. Goodwin, of Macon; Theodore Schumann, of Atlanta; Osceola Butler, of Savannah; O. C. Durham, of Augusta; and H. R. Slack, Jr., of La Grange.

California.—The seventeenth annual meeting of the California Pharmaceutical Society was held in San Francisco on November 10th. Twelve new members were elected. In the address of the President, Mr. John Dawson, it was mentioned that 50 students had matriculated in the senior and 27 in the junior class, 34 junior students had been examined for the higher grade, and 14 out of 15 seniors had passed the examination for the degree of Ph.G. During the preceding year, the membership had been reduced to 135, and the receipts from dues amounted to $542.00. The following-named officers were elected: President, Fred. C. Heil; Vice-Presidents, Dr. H. H. Behr, Prof. William T. Wenzell; Treasurer, Henry Michaels; Secretary, Chas. M. Troppmann; Librarian, Miss Josephine Barbat; Editor, William T. Wenzell; Trustees, John Calvert, William M. Searby, Emil Huppersberger, J. Argenti, D. M. Fletcher, Charles Troppmann, Henry Barbat. It was voted to reduce the dues of country members from $6.00 to $2.00, and of resident members from $6.00 to $4.00, and to request the Board of Trustees to arrange for a meeting in some interior town about the month of May next. A committee, consisting of Messrs. John Dawson, E. W. Runyon, and J. Calvert was appointed to solicit members for the American Pharmaceutical Association, and Prof. A. L. Lengfeld and J. Dawson were appointed to prepare a list of queries.

Kansas.—Dr. Robert S. Drake, of Beloit, the President of the State Pharmaceutial Association, writes us the following encouraging account of pharmaceutical matters in that State:

"It is my pleasure to report that we are making rapid advances, in the State of Kansas, in the profession of pharmacy; at our last annual meeting we gained 50 new members, and the attendance was about 300. Our recent pharmacy law is giving entire satisfaction to the legitimate pharmacists of the State. We are enforcing the law. Our board prosecuted twelve violations of the law this month and were successful in *every* case.

"The next meeting of the board will be held in Altana.

"It is our intention to raise the standard each meeting. At our last examination twenty-three (23) passed, out of sixty candidates. The stigma of 'saloonist' is being removed. We are beginning to receive the recognition that we have a right to demand.

"I have only been in the State three years, and am surprised to see how fast the public is being educated to the fact of the necessity of competent pharmacists. In procuring the passage of our amended bill through the Legislature, last winter, I was gratified and encouraged at the support and help the public gave our Committee on Legislation. When we made our arguments to the different members of the legislature, in support of the various sections of the law, we were agreeably surprised at the prompt support they gave us.

"So far, we have not failed in any prosecution that the board has attempted. The most of the complaints of violations of the law come from the public, and *not* from the competing pharmacists. Very few of the pharmacists make complaints of their competitors; we are gratified to know that it is *not* jealousy, revenge, or competition that prompts the complaints. It is that the public are demanding that it should be served by competent pharmacists. This is as it should be. As long as this state of affairs exists, the profession of pharmacy will advance. It is an old law that supplies will be furnished as they are demanded. The rising generation of pharmacy sees the actual necessity of educated pharmacists, it is now the ambition of almost every drug clerk to take a course at some college of pharmacy; they realize that they cannot compete with their neighbor if they do not educate themselves. The next five years will work a great revolution in the drug trade in this State. The graduates of pharmacy will then be the *rule* and *not* the exception, *as it is now*. When this comes to pass, life will not tremble in the balance or be sacrificed on the altar of ignorance or carelessness."

Jobst-Zimmer.—The well-known manufacturing firms of Friedrich Jobst, of Feuerbach-Stuttgart, and C. Zimmer, Frankfurt on the Main, have been consolidated into one corporation. The several factories, consisting of the Wholesale Depot for Drugs and Chemicals in Stuttgart, the Quinine and Chemical Works in Feuerbach, near Stuttgart, and the Branch Depot at Milan, are thus united under the new name: "Vereinigte Fabriken chemisch-pharmaceutischer Produkte, Feuerbach-Stuttgart, und Frankfurt a. M., Zimmer & Co." It seems to us, a briefer title would have been more advantageous.

Menthol and Aconitine.—A combination of menthol with aconitine, for external application, in form of cones, is reported to have met with much success in England. The proportions used are:

Aconitine	1 part.
Menthol	500 parts.

The aconitine is dissolved in alcohol, and the solution added to the melted menthol. The mass is then made into cones of about 2 oz. each.—SCHIMMEL & CO., Report on Oils.

Note by Ed. Am. Dr.—If commercial aconitine, without further designation, is used in this combination, it is possible that a rather weak alkaloid may happen to be chosen, or else, a very powerful variety may be pitched upon. We consider it improper and dangerous to countenance the use of such a compound without the advice and control of a physician, who will designate the kind of aconitine to be used, and will be able to watch and control its effects.

Saccharin has been introduced into pill-coating by an English drug firm.

The Toronto College of Pharmacy has 57 students, one of which is a woman.

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,065.—**Extraction of Essential Oil** (Dr. B. M. C. V., Carácas, South America).

"What would be the most practical and economical method for extracting an essential oil contained in a tree in small quantity, being soluble in water, ether, and alcohol; if possible, mechanical? I have treated the green plant, reduced to pulp, with ether, and after evaporation I have distilled it with salt water, giving me the essential oil, but this method would be to me very expensive."

Based upon the information furnished, we think that a still such as was described in our last volume as being in use in the Southern States (page 204) would answer the purpose very well. The material to be treated should be cut as fine as possible, for which purpose such a machine as is used by farmers in this country for cutting straw might be employed in the case of small twigs or juicy plants.

No. 2,066.—**Local Anæsthetic** (Dr. J. M. S.).

One of the most efficient local anæsthetics, to be employed in form of spray, is the lightest boiling portion of petroleum which is known in the market as rhigolene. This boils at 1° C. (33.8° F.), and is a liquid which must be handled with great care, as it emits an inflammable vapor even at low temperatures. That portion of petroleum which boils below 50° C. (122° F.) is usually collected by itself, and as such is known as naphtha or gasolene. A certain fraction of this, having a boiling point of about 68° C. (152° F.), is known as Canadol. This has also been recommended for the same purpose. But it is not as efficient as the other. Chloride of methyl is probably the most efficient of all these volatile agents; but, as this is not readily obtainable—having to be sent out in strong cylinders, in which the gaseous chloride of methyl is compressed into a liquid—we advise the employment of rhigolene.

No. 2,067.—**Armenian Pills** (M.).

These pills contain copaiba and cubebs, and have received their euphemistic title from the fact that they also contain Armenian bole. According to Schacht, they are prepared thus:

Copaiba	14 parts.
Magnesia	2 "
Cubebs, powdered	7 "
Armenian Bole, powdered	7 "

Heat the Copaiba on a steam bath until it acquires the consistence of a plaster [that is until most of the volatile oil has been dissipated], then mix it with the magnesia and set it aside that the mass may set. Next add the powdered Cubebs and Armenian Bole and mix intimately. Make the mass into pills of 0.5 Gm. (8 grains) each, and roll them in Armenian bole.

No. 2,068.—**Panawar-Jambi** (O. R.).

This substance, which is often spelled Pengawar-(or Pengwar-) Jambi, is derived from several species of *Cibotium*, chiefly *Cibotium Baromez* Kz., and *C. glaucescens* Kz., and *C. glaucum* Hook. Cibotium is a tree-fern, the dense, long hairs of which are found often as a thick covering upon contiguously growing trees. These hairs are light, soft, silky, and have almost a metallic lustre of a golden-yellow or bronze color. Each hair consists of a series of thin-walled cells, placed one over the other, and separated by horizontal, corrugated cell-walls. The cells are flat, and do not appear to have the power of taking up liquids by capillary attraction. Their hæmostatic properties are ascribed to the fact that the blood with which they are brought in contact softens the cell-wall, and dissolves the contents of the cell, which at the same time swell up. At least this is the explanation given by Vogl.

The Penawar-Jambi most generally met with in commerce is that which is derived from *Cibotium glaucum* Hook., native of the Sandwich Islands. This is also known by the special name *pulu*. This substance is exported largely as a stuffing material for mattresses, etc. Another kind, known as *pakoe-kidang* is derived from species of Alsophila and allied plants growing upon Java. This may be readily recognized by the fact that the hairs are twisted in an angle of 90 degrees at the point of juncture of the cells. This gives an extra lustre to this variety; besides, the hairs of the last-named are much longer and stronger.

As there are so many other, and more easily accessible hæmostatics, it is not likely that the demand for the above-described foreign articles, as surgical dressings, will ever again amount to much.

No. 2,069.—**Sulphate of Zinc Caustic** (M.).

Several prominent surgeons are in the habit of using a particular kind of caustic as an application to cancerous or other sores, when it is desired, not only to exert a powerfully escharotic action, but also to confine the action to a sharply circumscribed spot.

This caustic is prepared by mixing anhydrous sulphate of zinc with concentrated sulphuric acid to a paste.

Sulphate of zinc is exposed to the air in a warm room, until it has effloresced as far as possible (corresponding to a loss of 5 molecules of water). It is then dried at a temperature of 212° F. and afterwards at 230° F., until it is anhydrous. To make sure that all the water has passed off, the dry residue may be cautiously ignited, at a low red heat. A small loss of sulphuric acid will not interfere with its subsequent use. The residue is passed, while still warm, through a fine sieve, transferred to a glass-stoppered wide-mouthed bottle, and mixed with enough concentrated sulphuric acid, by means of a glass rod, to produce a paste of the consistence of honey. The bottle is then carefully stoppered, and the contents are ready for use. By keeping, the paste will become hard and dry.

No. 2,070.—**Liquor Magnesii Bromidi** (Oil City).

A solution of bromide of magnesium, containing 8 grains of the dry salt in a tablespoonful or ½ fluidounce, has been in use for some time, first in the Philadelphia Hospital, and lately also in other hospitals as well as in private practice. It may be prepared by the following process:

Diluted Hydrobromic Acid (U. S.)	2 fl. oz.
Carbonate of Magnesium	q. s.
Water, enough to make	7 fl. oz.

Diluted hydrobromic acid contains 10 per cent, by weight, of the absolute acid. One fluidounce weighs about 491 grains; hence, this contains about 49 grains of HBr, and the 2 fl. oz. contain about 98 grains of HBr; and this is equivalent to about 97 grains of bromine. But 97 grains of bromine, when combined in molecular proportions with magnesium (forming $MgBr_2$, 24 + 160 = 184) produce, in round number, 112 grains of bromide of magnesium. If the solution is then made to measure 7 fluidounces, the product will be of the strength above indicated.

The formula suggested by our correspondent is not correct.

No. 2,071. **Saccharin and its Solubility** ("D.").

The rate of solubility of saccharin which we gave in our last volume (p. 202) correct, and has been confirmed by others, though of course the figures there given were not determined with scientific accuracy. Our attention has, meanwhile, been directed to the fact that the manufacturers of saccharin advise it to be always combined with an alkali (sodium carbonate or bicarbonate). This is, of course, an important point which ought to be communicated to every purchaser or user of the substance. Saccharin is chemically regarded an acid. As has been stated by us, it requires about 80 parts of diluted alcohol for solution. When it is, however, neutralized with soda, the resulting salt is very much more soluble, 1 part requiring only about 9 parts of diluted alcohol (mixture of equal volumes of 94% alcohol and water) for solution. This concentrated solution may be diluted with water to any extent, without precipitating. Saccharin is one of those substances which are very apt to form a supersaturated solution. For instance, after we had succeeded in dissolving 7 Gm. of the soda salt of saccharin in 50 C.c. of the above-mentioned diluted alcohol, to an apparently stable and perfectly transparent solution, we set it aside for about half an hour, when we found that a portion of the salt had separated as a soft, bulky, crystalline lump. It required only a small quantity of the solvent to bring this back into solution. One of our wholesale friends some time ago brought us several vials, containing solutions of saccharin itself (not neutralized with soda). One of them contained a clear solution of 1 in 30 parts of the same diluted alcohol, of which we had found 80 parts requisite.

We told him that we suspected his sample to be supersaturated, and indeed next morning, all the excess had crystallized out.

Regarding the sweetening power of saccharin, we may add that the soda salt leaves a much more decided impression of sweetness upon the tongue and palate than the saccharin itself. We have submitted a number of samples of mixtures sweetened with saccharin or its sodium salt on the one hand, and with sugar on the other hand, to unprejudiced persons, and find that individual judgments vary considerably as to the *degree* of sweetness—that is, as to what might be regarded an exact equivalent in sweetness to a given quantity of sugar. In making such experiments, it is necessary to equalize the conditions as much as possible. A good plan is to prepare jellies with sugar and with saccharin respectively, so that each preparation may have about the same *body*.

No. 2,072.—**Tincture of Litmus** ("Senior.")

A very delicate tincture of litmus may be prepared by following Kretschmar's directions.

Macerate commercial, whole litmus in water for several

days, draw off the solution, and repeat the extraction with water, until the latter takes up but little more of the coloring matter. Then add to the united liquids enough hydrochloric acid to render the solution permanently red, evaporate it to a small bulk, mix it with clean sand, and then evaporate to dryness. Reduce the mass to a granular powder, and wash it, first with boiling, and afterwards with cold water. The grains of sand then retain only the pure coloring matter (Kane's azolitmin) which is almost insoluble in water free from alkalies. On treating the colored sand with hot water, containing a little ammonia, the coloring matter is dissolved. Its tint should be adjusted so, between alkali and acid, that a small sample of the solution, when diluted with much water, produces a violet-colored liquid.

The solution may be used without the addition of alcohol. In this case it is well to saturate it with chloroform, using a sufficient quantity of it to have some of it remain undissolved at the bottom. The bottle, which should only be closed with a pellet of cotton (as complete exclusion of air soon renders the liquid colorless), may be shaken up occasionally to saturate the liquid again with chloroform.

Or the liquid may be mixed with about 20 per cent of alcohol.

One pound of litmus will furnish about 6 pints of solution, or tincture, of proper depth of color.

No. 2,073.—**Red Fire** (A Subscriber, Albany, N. Y.)

"Will you kindly give me a receipt for making red fire of the best kind: 1, for such as is ordinarily used on the street and 2, for such as is used in theatres?"

Dr. Ure's dictionary gives the following formula in the article on Pyrotechny in general: 40 parts of nitrate of strontia, 13 of flowers of sulphur, 5 of chlorate of potash, and 4 of sulphuret of antimony.

Sergius Kern gives fifteen formulas for red fire on p. 715 of the supplement to Ure's dictionary, by which the time occupied in the burning can be regulated as desired, No. 1 being a quick burning compound and No. 15 the slowest.

On p. 215 of the AMERICAN DRUGGIST for 1885 you will find a variety of the latest formulas for Bengal lights, together with important information relating to them.

W. Canning says that mixtures of chlorate of potash, sulphur, and nitrate of strontium, in quantities larger than about an ounce, will frequently take fire within a few hours after they are made. When nitrate of baryta is substituted for strontia, the liability is nearly as great. When sulphuret of antimony or charcoal is added, the liability is greatly lessened, but probably not entirely done away with.

Erdman's formula for red fire for theatrical purposes or use in-doors consists of sulphur, 20 parts; saltpeter, 32 parts; chlorate of potash, 27 parts; chalk, 20 parts; charcoal, 1 part. This gives a rose-red light and is said to be perfectly harmless when used in a room.

The *Scientific American* some time since reported the death of a young lady in Bristol, New Hampshire, from inhaling the fumes of a red fire composed of nitrate of strontia, black sulphide of antimony, sulphur, and chlorate of potash.

In any case, the ingredients *must* be powdered separately and mixed without shock or friction—the best method being to use a bone paper-knife and a sheet of paper. It is also best to mix them only a short time before use.

No. 2,074.—**Agaricin** (St. Louis).

This acid principle derived from white agaric (*Polyporus officinalis* Fries), which is used with great success as a remedy for excessive or abnormal perspiration, is prepared in the following manner:

Powdered white agaric is exhausted with alcohol. The alcoholic solution, which contains four different resins, designated by Schmieder respectively as alpha-, beta-, gamma-, and delta-resin, is concentrated to a small bulk. This causes the separation of *white* resins containing the agaricin, while *red* resins remain in solution. The *white* resins are treated with alcohol with the addition of potassa. This causes the potassium salt of the alpha resin to go into solution, while the corresponding salt of the beta resin remains undissolved. The mixture is filtered, and the residue treated with water, which dissolves the potassium salt of the beta resin, while the gamma resin, which does not combine with potassa, remains undissolved. The aqueous solution of the *potassium salt of the beta resin* is now treated with solution of chloride of barium, causing the precipitation of agaricate of barium. This is dissolved in boiling 30-per-cent alcohol, and the solution decomposed by sulphuric acid. From the filtrate the agaricin gradually separates, and may be recrystallized from 30-per-cent alcohol.

Agaricin is described by the Pharmacopœia Committee of the Germ. Pharm. Assoc. as a white, amorphous, or white silky crystalline powder of a faint odor and taste, appearing under the microscope to consist of four-sided lamellæ, little soluble in cold water; soluble in hot water to a turbid strongly-foaming liquid, which reddens litmus. It is soluble in about 130 parts of cold and 10 parts of hot alcohol, still more easily in hot acetic acid, only slightly in ether, and scarcely at all in chloroform. Caustic alkalies dissolve it to a liquid which foams strongly when shaken. At 80° C., or when kept over sulphuric acid, it loses 1 molecule of water of crystallization.

The chemical formula of agaracin is $C_{16}H_{30}O_5.H_2O$ (mol. w. 320).

No. 2,075.—**Insecticide for Bedbugs, etc.** (M. O. A.).

This correspondent states that he has used the best insect powder for some time past without any success. He asks us to suggest something better.

We would recommend that our correspondent try either of the following:

1. Prepare an alcoholic tincture of the best Dalmatian insect powder, in the proportion of 2 troy oz. to the pint. In this dissolve 1 tr. oz. of shellac, 2 tr. oz. of naphthalin, and ½ tr. oz. of picric acid. With this solution paint the fissures, cracks, recesses, etc., of the bedstead and mattress frame, wherever the obnoxious insects are wont to congregate or hide.

2. Paint the places with a solution of 1 tr. oz. of corrosive sublimate in 2 fl. oz. of glycerin, and tinted with a little fuchsine. Only a thin coat is required, and this may be dusted over with insect powder, so that it will not be sticky to the bed-clothing that may come in contact with it.

3. Mix 3 av. oz. of borax, 8½ oz. of salicylic acid, and 1½ oz. of bicarbonate of sodium with 15 fl. oz. of alcohol and 10 fl. oz. of water, in a capacious capsule, and stir until no more gas is given off. Then evaporate the mixture, on a water-bath, to a syrupy consistence, and add to it 1 oz. of sulphate of zinc, 1 oz. of tartar emetic, 1 oz. of inspissated ox-gall, 30 grains of strychnine sulphate, and enough aniline violet to color. Place the capsule on a water-bath, and heat the contents, under constant stirring, until they become stiff and doughy. Remove the mass, while still hot and pliable, and form it into a roll, which may be wrapped in tin-foil or paraffin paper. When wanted for use, a small portion of the hardened mass is broken off and dissolved in about 10 parts of water. A little mucilage may then be added to it. This liquid is painted or brushed on precisely like either of the preceding ones.

The peculiar aniline-color tints of both of the last-named preparations are a sufficient caution to prevent either of them from being accidentally mistaken for harmless substances. Of course, both being poisonous, they should be kept in a secure place.

No. 2,076.—**To Render Tincture of Iron "Tasteless"** (J. A.).

Our correspondent, as he himself states, is aware how the so-called tasteless tincture of iron is prepared, and it is *not* his object to have his query understood as referring to this. He desires to learn of some way by which tincture of iron, at the time of administration, can be rendered tasteless, or at least less unpleasant to the taste.

Any process or method by which the characteristic astringent and ferruginous taste of ferric chloride or of tincture of chloride of iron is modified or neutralized involves certain molecular changes or a decomposition, resulting in the production of a new compound. For example, the "tasteless tincture of iron" which our correspondent alludes to, owes its tastelessness to the fact that the iron no longer exists as a chloride, but most probably as a citrate. And so it is with any other process that accomplishes the same purpose. In many cases, it may be entirely immaterial whether the iron introduced into the system is offered to it in the form of tincture of chloride of iron or in any other form (reduced iron, saccharated carbonate, citrate, phosphate, sulphate, etc., etc.). And in these cases the physician will probably have no objection whatever, if his patient seeks to render the administration of the remedy as pleasant to his taste as possible. There are, however, some cases in which the astringent character of the tincture is desired to produce a certain impression, that is, where the ferric chloride, in its alcoholic solution, is intended, *as such*, to reach the place where it is to produce the special impression, or where it is to be absorbed. In such cases, it would be improper to counteract the physician's plan by causing a chemical change in the compound before it has reached the intended place.

Having premised these remarks we will append two methods which, in our experience, are very effective in accomplishing the result desired.

1. Pour the measured quantity of tincture of iron, immediately before administering or taking it, into a sufficient quantity of *milk*, about a wineglassful for every 10 drops of tincture. This method was first recommended by Hager. The iron probably changes to phosphate in this case.

2. Pour the tincture into a sufficient quantity of *Vichy water*—about 1 fl. oz. for every 10 minims of tincture. This method is often practised in the public hospitals of this city. Our attention was first drawn to it by Dr. A. B. Pope. In this case, of course, the iron changes to carbonate, the carbonic acid being speedily disengaged, and ferrous hydrate being deposited on standing. In this form it has been found to be quite easily taken, and, so far as known, with best results.

No. 2,077.—**Blaud's Pills** (V.).

We have heretofore given several formulas for preparing Blaud's Pills, but most of them contained acacia

as an ingredient. This is also the case with the formula of the French Pharmacopœia, in which the pills are contained under the title "Pilules Ferrugineux de Blaud," with the Latin (?) synonym "Pilulæ D. Blaud." It has, however, recently been pointed out that acacia is an undesirable constituent, as it is apt to react with the iron, and produce an insoluble compound in the course of time.

In order to enable our correspondent to examine the merits of formulæ omitting the acacia, we place here two from among those last published.

1. *Dieterich.*

	Gm.	Grains.
Sulphate of Iron, cryst.	100.	1540
Carbonate of Potassium	50.	775
Magnesia	5.	77
Sugar, in fine powder	100.	1540
Althæa, in fine powder	50.	775
Glycerin	q. s.	q. s.

Triturate the Sulphate of Iron to as fine a powder as possible, mix it with the Carbonate of Potassium and Magnesia, and then add the Sugar and Althæa. Finally mix it with enough Glycerin to form a pill mass.

If this mass is divided into 640 pills, each pill will contain about 1 grain of ferrous carbonate.

The mass should have and retain a handsome green color. This is best attained by using only so much carbonate of potassium as is necessary to decompose the iron salt.

The sugar and althæa may be omitted. But the mass will then gradually become hard and indigestible.

2. *British Formulary* ("B. P. C." Unofficial Formulary).

Sulphate of Iron	60 grains
Carbonate of Potassium	36 "
Sugar, in powder	12 "
Tragacanth, in powder	4 "
Glycerin,	
Distilled Water	āā 2½ min.

Reduce the Sulphate of Iron to a fine powder, add the Sugar and Tragacanth, and mix intimately. Finely powder the Carbonate of Potassium in another mortar, and thoroughly incorporate with it the Glycerin and Water. Transfer this to the mortar containing the Sulphate of Iron, beat thoroughly until the mass becomes green and assumes a soft, pillular consistence and divide into 24 pills.

Each pill contains about 1 grain of ferrous carbonate.

The theoretical quantity of ferrous carbonate obtainable from crystallized sulphate of iron is at once seen by inspecting the molecular weights:

$FeSO_4.7H_2O$	$FeCO_3$
ferrous sulphate	ferrous carbonate
278	116

or, in percentage, 100 parts, by weight, of ferrous sulphate yield 41.7 per cent of ferrous carbonate.

No. 2,078.—**Albuminate of Iron** (Iowa).

We have previously published several formulas for preparing this compound, but we have no means of ascertaining at the present time how the several products, as prepared by the given formulæ, compared with each other, or what keeping qualities they showed. From reports now and then published in the pharmaceutical press, however, it would appear that all known processes suffer from some defect or other. Recognizing this fact, W. Gruening has recently (*Pharm. Zeitsch. f. Russl.*, 1887, Nos. 34–36.) studied the features of these processes, and partly on the experience thus gained, but chiefly on the results of an analysis of a proprietary preparation made by Drees, he elaborated a new process, which is said to give an unexceptionable product. We have not tried it, as we had no demand for the preparation. But we understand that many physicians would be glad to employ this compound, even if only in an experimental way, as it is considered, theoretically, to contain iron in a most suitable condition for absorption. Gruening's process is as follows:

45 Gm. of dry egg-albumen are mixed with 270 Gm. of distilled water. When it is completely dissolved, 49 Gm. of liquor ferri acetatis (Russian Pharm.), of spec. grav. 1.134–1.138 [or the corresponding preparation of the U. S. P. diluted to the same density] are added, the mixture several times shaken, and, if necessary, passed through a small linen strainer. If any residue remains, this may be washed with 40–50 Gm. of water. The liquid is now transferred to a parchment-paper dialyzer, and dialyzed with fresh supplies of water until the contents form a jelly. This is now mixed with 10 Gm. of hydrochloric acid and dissolved by gentle agitation, and the resulting liquid dialyzed again, until the liquid has only a very faint acid reaction with litmus. When a small sample, poured into a flat capsule, and with a few drops of ammonia, and covered with a piece of paper saturated with sulphuric acid, remains liquid after the lapse of a few hours, the dialysis may be considered as completed. The liquid, which has now again assumed the consistence of a thin jelly, is removed from the dialyzer, and gradually mixed with dilute soda solution, until the precipitate first formed is again dissolved, but so that an excess of soda is carefully avoided, as this would produce a jelly of albuminate of sodium. For this reason it is advisable to add, at first, only enough soda to just start the solution of the jelly. The mixture is set aside for 12 hours, then strained, and if a residue has remained, this is cautiously dissolved by a few drops of soda solution. To the liquid are now added 75 Gm. of cinnamon water [spiritous; containing about 20% of alcohol], and enough water to make the liquid weigh 750 Gm. And, finally, 250 Gm. of alcohol of 90% are added, under brisk agitation.

The resulting product contains about 0.5% of ferric oxide and 3.04% of albumen, and about 25% of alcohol.

No. 2,079.—**Prescription Difficulty** (E. A.).

This correspondent sends us the following communication:

"In a recent issue of the *Pharmaceutical Journal*, a case of fatal poisoning is reported to have occurred in Australia (on the authority of the *Australian Journal of Pharmacy*) from the administration of the following mixture:

℞ Potassii Chloratis	gr. 40
Syr. Ferri Iodidi	fl. ʒ 4
Syrupi	fl. ʒ 4
Spir. Chloroformi	♏ 20
Aquæ	q. s. ad fl. ℥ 2

"As reported there, 'the mixture, when dispensed, was of a light-brown color, which gradually darkened, and in a few hours iodine was deposited in abundance. In this condition, the mixture was administered to a child, eventually causing death. The prescriber condemned the dispensing of the mixture, which he said should have been almost colorless, and he held the dispenser to be liable for the consequences. But an expert to whom the subject was referred failed, after various trials, to prepare a presentable mixture.'"

We are asked to explain the cause of the decomposition, if possible.

On consulting the September number of the *Australian Journ. Pharm.*, we find the original report of Mr. J. M. Higgins, the expert who examined the prescription. He enumerates the several trials he made to prepare it as follows:

1. Mixed the syrup of iodide of iron and simple syrup together; then added the spirit of chloroform, and lastly the chlorate dissolved in cold water. The result was a yellowish-green mixture, which in a short time turned red, and in a few hours flocks of iodine appeared.

2. Mixed the solution of the salt with the simple syrup and spirit, and gradually added the syrup of iodide of iron. Same result as in No. 1.

3. Warm water employed to dissolve the salt. Decomposition took place immediately.

4. A drop or two of liquor potassæ added to the solution of the chlorate arrested the chemical action for a short time only.

Only pure substances were used.

On repeating the above-detailed experiments, we find that, when all the ingredients except the chlorate are mixed, the solution remains unaffected by starch, showing that no iodine is set free. On adding the chlorate, however, decomposition very soon begins, and if gelatinized starch had previously been added, a violet to blue tint is soon produced. Now this liberation of iodine can only be accounted for by the presence of some agent which will decompose the chlorate, so that chlorine is set free, the chlorine then liberating an equivalent amount of iodine. The only agents likely to be present which will accomplish this, are free acids. On examining any commercial sample of iodide of iron, it will be found that they all have an acid reaction, due to the presence of small quantities of hydriodic acid. If hydriodic acid is capable of eliminating chlorine from chlorate of potassium, a simple experiment will decide this. This is, in fact, the case, but only when the acid is moderately concentrated. The chlorine, however, at the moment of being liberated, in its turn liberates iodine, and this is revealed by its reaction with starch. Yet the whole reaction, even with a moderately strong hydriodic acid, is not very energetic, the amount of iodine altogether liberated and recognizable by starch being comparatively small. (If hydrochloric acid is substituted for hydriodic, a very small quantity is capable of causing the slow elimination of chlorine.) Another portion of chlorine probably combines with iodine and escapes the test. This reaction, thus observed to take place with a rather concentrated acid, does not, however, of itself account for the action of the exceedingly small quantity of hydriodic acid which is present in a well-made and fresh syrup of iodide of iron. It suggests itself here to make an attempt to remove all traces of free acid from the syrup of iodide of iron. We have endeavored to accomplish this by means of carbonate of calcium. On shaking equal volumes of the syrup and of water with an excess of carbonate of calcium and filtering, the excess of acid is, indeed, removed, and when such a syrup (which is only half-strength, on account of the water present) is used in equivalent proportion for the preparation of the above-mentioned mixture, the result is a greenish-yellow liquid which does *not* give a reaction with starch at first. On standing, however, a slight reaction will be produced after some time, and this gradually becomes intensified on

further standing. Now it is well known that, under the influence of light and air, and in the presence of water, ferric iodide constantly eliminates traces of hydriodic acid, which will, under certain conditions, decompose so that the iodine is set free, giving the solution a dark color. In the presence of sugar or certain other substances (such as hypophosphorous acid), however, the free iodine is again taken up and reconverted into hydriodic acid. As the process of eliminating hydriodic acid seems to go on continually, it appears to us that this body exerts its decomposing action on the chlorate while in *a nascent state*. But the eliminated chlorine immediately again decomposes the trace of iodide formed. We can account for the reaction in no other way, but would suggest that this subject be taken up by some one who has the necessary time to devote to its study. Incidentally we would remark that the presence of peroxide of hydrogen in the atmosphere, or the addition of peroxide of hydrogen to hydriodic acid or to iodides causes an abundant liberation of iodine. It is not impossible that the presence of this body may have something to do with the reaction.

No. 2,080.—**Cod-Liver Oil Emulsion** (Subscriber).

The use of lime-water for the purpose of preparing an "emulsion" of cod-liver oil is not at all uncommon, but does not deserve indorsement, unless it be the express desire of the prescriber to present the oil to the intestinal canal of his patient in form of a lime soap. Of course, a mixture of lime-water and cod-liver oil (or any other fixed oil) is no emulsion, in the true sense of the word, but produces a lime soap, which is but little soluble in water. Yet it is known that this compound is by no means rejected by the digestive organs, being sometimes (according to some authorities) even more easily taken up than the unchanged oil itself.

The question has been repeatedly put to us, and also by "Subscriber," whether it is not possible to replace gum arabic—which has becomes very expensive and almost a luxury—by some cheaper and equally efficient substitute. There are, indeed, various methods of preparing emulsions, besides that which requires the use of acacia, such as those made with Irish Moss, Glyconin, Tragacanth, Quillaja, etc., but each of these has slight drawbacks, either requiring some time and trouble to prepare, or being but little less expensive than the acacia emulsion. One of us has had this problem presented to him during the last year in a very prominent manner. The supply of cod-liver oil emulsions, prepared in considerable quantity by means of acacia, for the use in public dispensaries, it apt to become an expensive item, and induces a careful search after something equally serviceable and cheaper. Such a substitute has been found in *Dextrin*, and by means of this, an excellent emulsion may be prepared without the least trouble.

The market offers various qualities of dextrin. In tint it varies from yellowish or yellowish-gray to pure white. Some is prepared by mere heat and subsequent washing. Another kind is prepared by means of acids (oxalic, etc.), and washing. It makes no difference by which of these processes it is prepared, so long as it is neutral to test-paper, of a white or whitish color, having not more than a slight yellowish tint, and, when dissolved in water, free from disagreeable odor and taste. Every kind of commercial dextrin, especially when mixed or dissolved in water, has more or less of an odor, but in the better grades this is so slight, and so easily overcome by suitable flavoring, that it may be disregarded. Pure dextrin is soluble to a clear, limpid liquid in less than its own weight of water. But commercial dextrin usually contains more or less unaltered starch. *For the purpose of making emulsions, the presence of a moderate proportion of starch in dextrin is an advantage.*

Having procured a dextrin corresponding to the description here given, the first step is to prepare a *mucilage of dextrin*. And it may be presumed that those who want to employ this method of making emulsions desire to keep the mucilage in stock, so as to enable them to prepare the emulsion quickly when wanted, we shall give the necessary direction for this purpose.

1. MUCILAGE OF DEXTRIN.

(*For Emulsions.*)

Dextrin	1 part
Water, enough to make	3 parts

Mix them in a tared vessel, and heat the mixture, under constant stirring, to near boiling, until it is limpid. Then restore any water lost by evaporation, strain the liquid through muslin, and transfer it, while hot, to bottles, which should be filled to the neck. Pour a sufficient quantity of best olive oil on the surface, to form a protecting layer and set the bottles aside in a cool place, so that the contents may congeal to a jelly. Then cork them securely and keep them in a cool place, in an upright position.

Note.—When this mucilage is to be used for preparing emulsion of cod-liver oil, or for other mixtures, the protecting layer of oil on the surface is first poured off and the remainder removed by a pellet of absorbent cotton. The bottle is then gently warmed until the contents are melted, and allowed to cool again short of causing the mucilage to again solidify, when it may be mixed with the cod-liver oil or other ingredients.

2. DEXTRIN EMULSION OF COD-LIVER OIL.

Cod-liver oil	8 fluidounces
Mucilage of dextrin	5 " "
Water	2 " "
Syrup	1 fluidounce
Flavoring	q. s.

To the mucilage of dextrin, contained in a capacious bottle, gradually add the cod-liver oil, first in small portions, and agitate thoroughly after each addition, until the oil is emulsified. Finally add the syrup, the water, and the flavoring, and mix the whole thoroughly together.

As in the case of other emulsions, when larger quantities are to be prepared, it is best to use some mechanical contrivance for incorporating the ingredients. Of all mixing appliances known to us, the Keystone Beater (to be obtained at 28 Vesey street, New York) seems to us the most simple and best.

If salts, such as hypophosphites, etc., are to be combined with the emulsion, they may be dissolved in a portion or the whole of the water directed to complete the 16 fluid ounces of emulsion.

If well made, a dextrin emulsion of cod-liver oil is *at least* as stable as one made with acacia. And even if it should be partially separate at first, it is so easily and quickly restored that any tendency to separation, due to hasty preparation, is no practical drawback. In fact, should it have separated, it will be found that the tendency to do so will disappear entirely after it has been kept a few days, and has meanwhile been occasionally reshaken. The quantity of mucilage of dextrin here given will make a rather dense emulsion. One of the consistence of thin cream may be made by reducing the mucilage to 4 fl. oz. Even if this should separate during the first few days, it will soon acquire stability.

No. 2,081.—**Bleaching of Feathers and Hair** (Boston).

The art of bleaching feathers or hair is one that requires considerable practice and experience. We can give here only an outline and must refer you for fuller information to special works on the subject.

Feathers as well as hair, in their crude condition (such, for instance, as are sold in quantities in the market) are usually covered with more or less fatty matter and dirt or dust. This must be carefuly removed. For this purpose, the feathers are laid in a 10 per cent solution of carbonate of sodium (sal soda), and the latter then gradually heated to about 180° F. If the feathers, etc., are valuable, they must be fastened singly and in rows to sticks, and suspended in the liquid so that they do not touch each other.

When they have been in the liquid for about an hour, they are transferred to clean water and carefuly washed. And until they are further manipulated, they are left in the water to prevent new dust, etc., from settling upon them.

The bleaching is done, either by hanging the wet feathers, etc., in a room, in which sulphur is afterwards burnt, or better, by macerating them in a solution of peroxide of hydrogen. For this purpose, the commercial 10 volume solution is sufficiently pure. It is best to use three baths (agate-ware, oblong pans are very useful). The feathers, etc., are first placed into No. 1 and covered with the solution. To economize the latter, some pieces of glass rod or plate may be laid upon them to keep them down. After 24 hours they are taken out, transferred to No. 2 and covered with a fresh quantity of solution, while a new supply of washed feathers is put into No. 1. After the next 24 hours, the contents of No. 2 are put in No. 3 and again treated with fresh solution, while the contents of No. 1 are put in No. 2, and No. 1 supplied with fresh feathers. Finally, after 24 hours more, the feathers, etc., in No. 3 have been acted upon by the bleaching liquid as far as possible. The process is kept up continuously, so that each lot of feathers, etc., is kept in bleaching liquid during 72 hours. When No. 1 becomes exhausted, the liquid is thrown away, fresh liquid put in, and the pan becomes then No. 3, the previous No. 2 and 3 becoming, respectively, No. 1 and 2.

Of course, dark colored feathers cannot be bleached completely white. If perfectly white feathers are wanted, the original feathers must have been at least whitish or grayish-white. In many cases, even the longest contact with bleaching material will not render the feather absolutely white. The manufacturer overcome this by the same trick which is used by the laundress in making up white goods (addition of bluing to the starch), namely by placing the feathers in an extremely dilute solution of an aniline violet having a bluish tint.

No. 2,082.—**Solubility of Terpin** ("Baltimore," and E. O.).

In answering a query as to a suitable solvent for terpin hydrate, in our December number (Query 2,062), we referred to page 140 of our last year's volume. The solvent there mentioned is the Acidum Nitricum Alcoholisatum of the French Pharm. As it is, however, doubtful whether this solvent will answer in all cases, we would, under ordinary circumstances, rather prefer alcohol as a solvent.

1 part of terpin hydrate requires about 7 parts (by weight) of 85% alcohol for solution, according to Deville. According to our own experience, 1 part is soluble in about 9 parts of officinal (94%) alcohol, which corresponds to a proportion of 1 troy ounce of terpin hydrate to about 11½ fluid-ounces of the alcohol.

Terpin hydrate is soluble also in 200 parts of cold, and in 22 parts of boiling water.

No. 2,083.—**Pharmaceutical Apparatus** (S.).

The address of Messrs. Canning and Patch is 109 Green str., Boston, Mass.

We shall be glad to give you the other desired information, if you will inform us what special kind of pharmaceutical apparatus you are in search of.

No. 2,084.—**Glycerite of Subacetate of Lead** (S.).

We are asked to state what the standard strength of this preparation is, that is, what percentage of subacetate —$Pb(C_2H_3O_2)_2.Pb.O = 548$—the product should contain.

The preparation is officinal in the British Pharm., and directed to be made by mixing together

Acetate of Lead	5 oz.
Oxide of Lead	3½ oz.
Glycerin	1 pint
Water	12 oz.

boiling for a quarter of an hour, then filtering, and evaporating until the water is dissipated.

Assuming that the whole of the acetate of lead taken is converted into the theoretically possible amount of subacetate, also assuming that all the water is dissipated, without loss of glycerin, the product would contain

Subacetate of Lead	3,166 grains.
Glycerin (1 pint, Imper. meas., sp. gr. 1.250)	11,036 "
	14,202 grains.

This would be equivalent to about 22.3 per cent of subacetate.

No. 2,085.—**Spence Metal** (B.).

Our correspondent asks us several questions about the casting of Spence's Metal of which we have given a full account in NEW REMEDIES, 1880, page 137.

We regret to say that we have no practical experience with the metal, and would refer our querist to Messrs. Spence & Co., 31 Lombard street, London, E. C. We know of no depot in this city.

No. 2,086.—**" Churchill's Iodine "** (T.).

There are two iodine preparations known by Churchill's name, viz.:

1. *Churchill's Tincture of Iodine:*

Iodine	2½ tr. oz.
Iodide of Potassium	½ tr. oz.
Alcohol	13 fl. oz.
Water	3 fl. oz.

2. *Churchill's Iodine Caustic:*

Iodine	1 tr. oz.
Iodide of Potassium	2 tr. oz.
Water	4 fl. oz.

No. 2,087.—**Recognition of Graduates of Pharmacy by Boards of Pharmacy** (K.).

The Boards of Pharmacy of the State of New York are not all on the same basis, so far as the recognition of Graduates of Pharmacy is concerned. The State Board, having jurisdiction in all counties but New York, Kings, and Erie, is not required to accept diplomas as evidence. Hence even Graduates have to undergo an examination. In the three counties mentioned, which have, each, a separate pharmacy law, the act provides for the recognition of graduates.

The law makes no difference between Graduates of Colleges within or without the State. A graduate of the Chicago College of Pharmacy would, therefore, have as good a chance, in the three counties named, as a Graduate from New York. But if he wants to be registered by the State Board, he will have to stand an examination.

No. 2,088.—**Blue Prints** (J. D. C.).

A very full explanation of the details of the process of making blue prints has been given by us on page 117 of our last volume (under Query No. 1,956).

No. 2,089.—**Syrup of Lactophosphate of Calcium** (or **Lime**) (E. A. S.).

The so-called soluble lactophosphate of lime is not a true chemical compound, though it is believed to be pretty uniform, as found in the market. The above-named preparation may be made either by dissolving phosphate of calcium in lactic acid and syrup, or by dissolving lactate of calcium in phosphoric acid and syrup, or by dissolving the commercial "lactophosphate of calcium (lime)" in syrup.

The United States Pharm. gives a formula for the syrup, which starts from phosphate of calcium. This furnishes a satisfactory product. But in order to show how the several processes may be applied, upon quantities of 1 pint of product, each, we shall give formulas for all three methods, the products being practically identical, though there is always a factor of doubt in the case of the commercial lactophosphate.

It so happens that the molecular weights of calcium phosphate and calcium lactate are so nearly alike that equal quantities of the two salts may be regarded, practically, as containing equal quantities of calcium [*Calcium lactate:* $Ca(C_3H_5O_3)_2$—mol. w. 308. Calcium phosphate: $Ca_3(PO_4)_2$—mol. w. 310].

1. *U. S. Ph. process*, calculated for 1 pint of product, and modified so as to simplify the process.

Triturate 220 grains of Precipitated Phosphate of Calcium with 330 grains of Lactic Acid, 1¾ fluidounces of Orange Flower Water, and 6 fluid ounces of Water gradually added, until the calcium salt is dissolved. Then add 13 troy ounces of sugar, and enough water to make 1 pint. Dissolve by agitation and strain if necessary.

2. *With Lactate of Calcium.*—Dissolve 220 grains of Lactate of Calcium with 220 minims of Phosphoric Acid (50%), 1¾ fl. oz. of Orange Flower Water, and 6 fluidounces of Water, and proceed further as under No. 1.

3. *With Lactophosphate.*—Dissolve 330 grains of so-called soluble Lactophosphate of Calcium in 1¾ fl. oz. of Orange Flower Water and 6 fl. oz. of Water, and continue as under No. 1.

No. 2,090.—**Cornutin** (H. W. I.).

Prof. Kobert's cornutin, a peculiar principle extracted from ergot, which is said to be the most prominent representative of the oxytocic properties of ergot, is manufactured by Gehe & Co., of Dresden. You may order it through any importing house. It is very expensive, and is likely to cost, delivered here, not much less than one dollar a grain.

No. 2,091.—**National Formulary** (H. and several other inquirers).

In reply to a number of inquiries received, it is here stated that the printing of the text of the National Formulary is progressing as rapidly as is consistent with careful editing. It is expected that the work will be out during the latter part of March, 1888.

No. 2,092.—**Bismuth Free from Arsenic** (J. A. H.).

There are several ways by which bismuth may be freed from arsenic. The U. S. Pharmacopœia of 1870 had a process for preparing bismuth salts in which provision is made for the removal of the arsenic in shape of arseniate of bismuth. But it is believed that it usually failed to remove the whole of it.

A very good process to accomplish the desired object is the following, originally devised by Biltz, and adopted in the last German Pharmacopœia.

Heat 2 parts of commercial bismuth with 1 part of nitrate of sodium, in an iron capsule or crucible, to a faint red heat. As soon as the mass begins to swell, stir it with an iron spatula continuously (for about one hour) until the metal is so finely distributed that it is scarcely possible to recognize it as such any longer. Then remove the vessel from the fire, allow the mass to cool somewhat, then add 5 parts of water and 3 parts of solution of soda, of spec. gr. 1.160. Boil the whole during a few minutes, constantly stirring, transfer it upon a filter, wash the mass until it is perfectly free from alkali, and dry. The residue consists of finely divided metallic bismuth and a little oxide of bismuth, which are both dissolved when nitric acid is made to act upon them. The original impurities, viz., arsenic, sulphur, and selenium, pass into solution in the alkaline liquid. According to Hirsch, however, a trace of arsenic may still be present in the residual mass, as basic arsenate of bismuth.

No. 2,093.—**Prescription Query** (B. J. E.).

This correspondent writes:

"I have a prescription for:

℞ Cinchonid. Sulph. Fort. Will you please state what the prescriber meant. I am told that physicians write the above for *Quinine*, when they do not want their patient to know that they are taking quinine."

The information given to our correspondent appears to be correct. In prescriptions coming under our experience, the above synonym for quinine has not yet been met with, and after consulting some of our friends, we believe that the above term is confined to the practice of a few physicians. It is not a practice to be recommended or approved, as it establishes a false position between physician, patient, and pharmacist; and besides, it is a weak concession to the unjust prejudice engendered in the minds of many gullible persons, by the venders of certain nostrums, who frighten them with the assertion that "quinine poisons the system, settles in the bones, etc., etc."

Information wanted.

1. What is Tomatin? Stated to be coloring matter used for coloring tomato catsup a dark "brick dust" color.

2. What is the composition of Dr. Wilhoft's Antiperiodic?

3. What is the composition of Kennedy's Medical Discovery?